

VPDES SEWAGE SLUDGE PERMIT APPLICATION FORM

SCREENING INFORMATION

This application is divided into sections. Sections A pertain to all applicants. The applicability of Sections B, C and D depend on your facility's sewage sludge use or disposal practices. The information provided on this page will help you determine which sections to fill out.

1. All applicants must complete Section A (General Information).

2. Will this facility generate sewage sludge? ☒ Yes ☐ No

Will this facility derive a material from sewage sludge? ☒ Yes ☐ No

If you answered Yes to either, complete Section B (Generation Of Sewage Sludge Or Preparation Of A Material Derived From Sewage Sludge).

3. Will this facility apply sewage sludge to the land? ☒ Yes ☐ No

Will sewage sludge from this facility be applied to the land? ☒ Yes ☐ No

If you answered No to both questions above, skip Section C.

If you answered Yes to either, answer the following three questions:

a. Will the sewage sludge from this facility meet the ceiling concentrations, pollutant concentrations, Class A pathogen reduction requirements and one of the vector attraction reduction requirements 1-8, as identified in the instructions?
☐ Yes ☒ No

b. Will sewage sludge from this facility be placed in a bag or other container for sale or give-away for application to the land? ☐ Yes ☒ No

c. Will sewage sludge from this facility be sent to another facility for treatment or blending? ☐ Yes ☒ No

If you answered No to all three, complete Section C (Land Application Of Bulk Sewage Sludge).

If you answered Yes to a, b or c, skip Section C.

4. Do you own or operate a surface disposal site? ☐ Yes ☒ No

If Yes, complete Section D (Surface Disposal).

SECTION A. GENERAL INFORMATION

All applicants must complete this section.

1. Facility Information.
 - a. Facility name: Atlantic STP
 - b. Contact person: Jamie Mitchell
Title: Chief of Technical Services Division
Phone: (757)460-4220
 - c. Mailing address:
Street or P.O. Box: 1434 Air Rail Avenue
City or Town: Virginia Beach State: VA Zip: 23455
 - d. Facility location:
Street or Route #: 645 Firefall Drive
County:
City or Town: Virginia Beach State: VA Zip: 23454
 - e. Is this facility a Class I sludge management facility? ☒ Yes ☐ No
 - f. Facility design flow rate: 54 mgd
 - g. Total population served: 343,016
 - h. Indicate the type of facility:
☒ Publicly owned treatment works (POTW)
☐ Privately owned treatment works
☐ Federally owned treatment works
☐ Blending or treatment operation
☐ Surface disposal site
☐ Other (describe):
2. Applicant Information. If the applicant is different from the above, provide the following:
 - a. Applicant name: Hampton Roads Sanitation District
 - b. Mailing address:
Street or P.O. Box: 1434 Air Rail Avenue
City or Town: Virginia Beach State: VA Zip: 23455
 - c. Contact person: Jamie Mitchell
Title: Chief of Technical Services Division
Phone: (757)460-4220
 - d. Is the applicant the owner or operator (or both) of this facility?
☒ owner ☒ operator
 - e. Should correspondence regarding this permit be directed to the facility or the applicant? (Check one)
☐ facility ☒ applicant
3. Permit Information.
 - a. Facility's VPDES permit number (if applicable): VA0081248
 - b. List on this form or an attachment, all other federal, state or local permits or construction approvals received or applied for that regulate this facility's sewage sludge management practices:

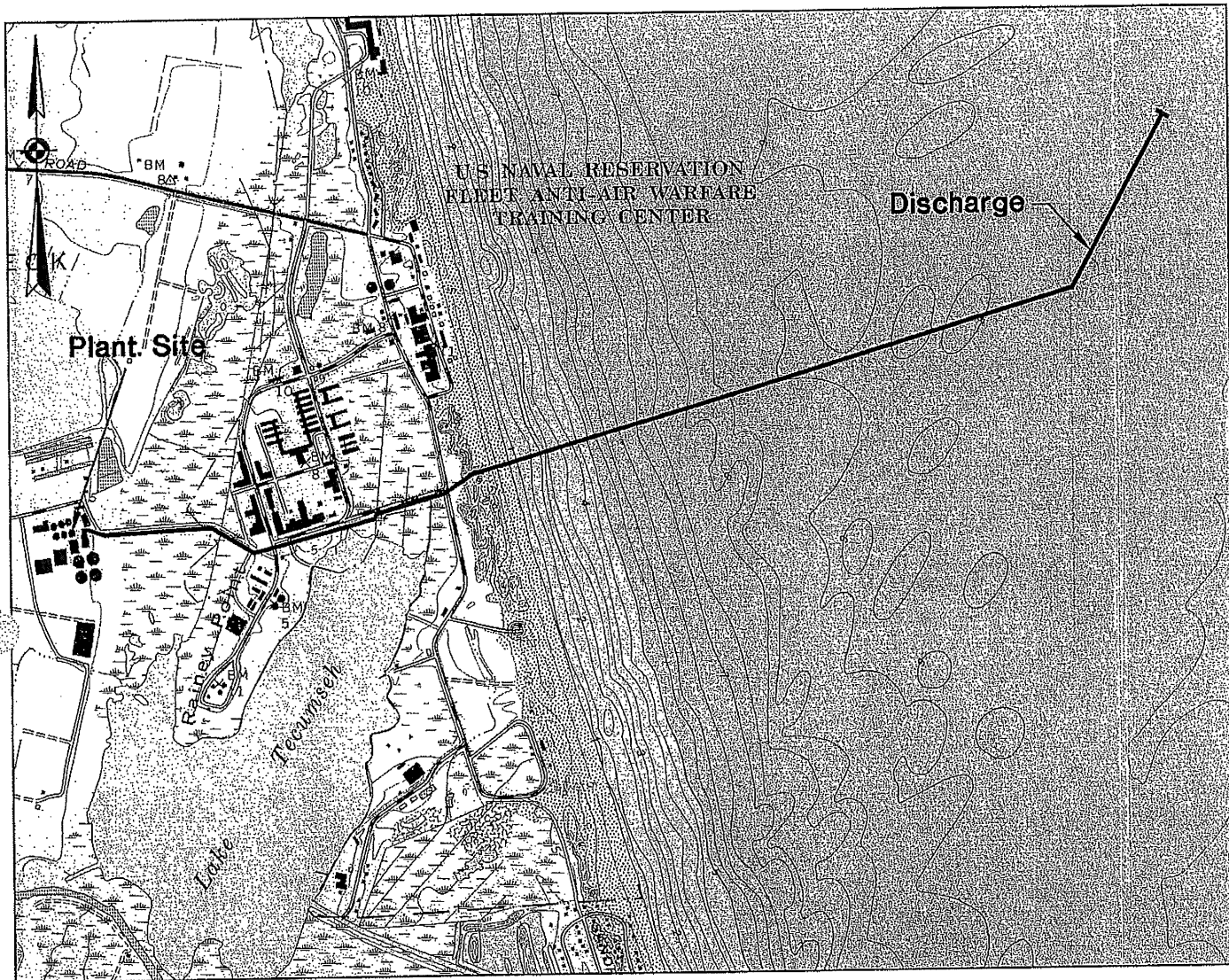
<u>Permit Number:</u>	<u>Type of Permit:</u>
<u>VAD980720353</u>	<u>RCRA</u>
<u>60959</u>	<u>DEQ-Air Division</u>
4. Indian Country. Does any generation, treatment, storage, application to land or disposal of sewage sludge from this facility occur in Indian Country? ☐ Yes ☒ No If yes, describe:

FACILITY NAME: Atlantic STP

VPDES PERMIT NUMBER: VA0081248

5. Topographic Map. Provide a topographic map or maps (or other appropriate maps if a topographic map is unavailable) that shows the following information. Maps should include the area one mile beyond all property boundaries of the facility:
- Location of all sewage sludge management facilities, including locations where sewage sludge is generated, stored, treated, or disposed.
 - Location of all wells, springs, and other surface water bodies listed in public records or otherwise known to the applicant within 1/4 mile of the property boundaries.
6. Line Drawing. Provide a line drawing and/or a narrative description that identifies all sewage sludge processes that will be employed during the term of the permit including all processes used for collecting, dewatering, storing, or treating sewage sludge, the destination(s) of all liquids and solids leaving each unit, and all methods used for pathogen reduction and vector attraction reduction.
7. Contractor Information. Are any operational or maintenance aspects of this facility related to sewage sludge generation, treatment, use or disposal the responsibility of a contractor? X Yes No
If yes, provide the following for each contractor (attach additional pages if necessary).
Name: Ag Nutrients, Inc.
Mailing address:
Street or P.O. Box: P.O. Box 57008
City or Town: Virginia Beach State: VA Zip: 23457
Phone: (757)426-6824
Contractor's Federal, State or Local Permit Number(s) applicable to this facility's sewage sludge:
HRSD VPDES VA0081248
If the contractor is responsible for the use and/or disposal of the sewage sludge, provide a description of the service to be provided to the applicant and the respective obligations of the applicant and the contractor(s). Contractor is responsible for maintaining storage pad area. Contractor conducts applicable soils monitoring to prospective land application sites, calculates appropriate nutrient application rates, and land applies biosolids in accordance with all state and federal regulations. Contractor provides biosolids nutrient information to farmer. HRSD is responsible for providing contractor with biosolids that meet Class B pathogen requirements, vector attraction requirements, and Table III pollutant concentrations. HRSD monitors the land application operations to ensure all site management requirements are met. Land application sites are permitted under HRSD VPDES VA0081248.
8. Pollutant Concentrations. Using the table below or a separate attachment, provide sewage sludge monitoring data for the pollutants which limits in sewage sludge have been established in 9 VAC 25-31-10 et seq. for this facility's expected use or disposal practices. All data must be based on three or more samples taken at least one month apart and must be no more than four and one-half years old. **See attached sheet.**

POLLUTANT	CONCENTRATION (mg/kg dry weight)	SAMPLE DATE	ANALYTICAL METHOD	DETECTION LEVEL FOR ANALYSIS
Arsenic				
Cadmium				
Chromium				
Copper				
Lead				
Mercury				
Molybdenum				
Nickel				
Selenium				
Zinc				



Location Map
for
Atlantic TP

June 2003

Scale: 1"=2000'

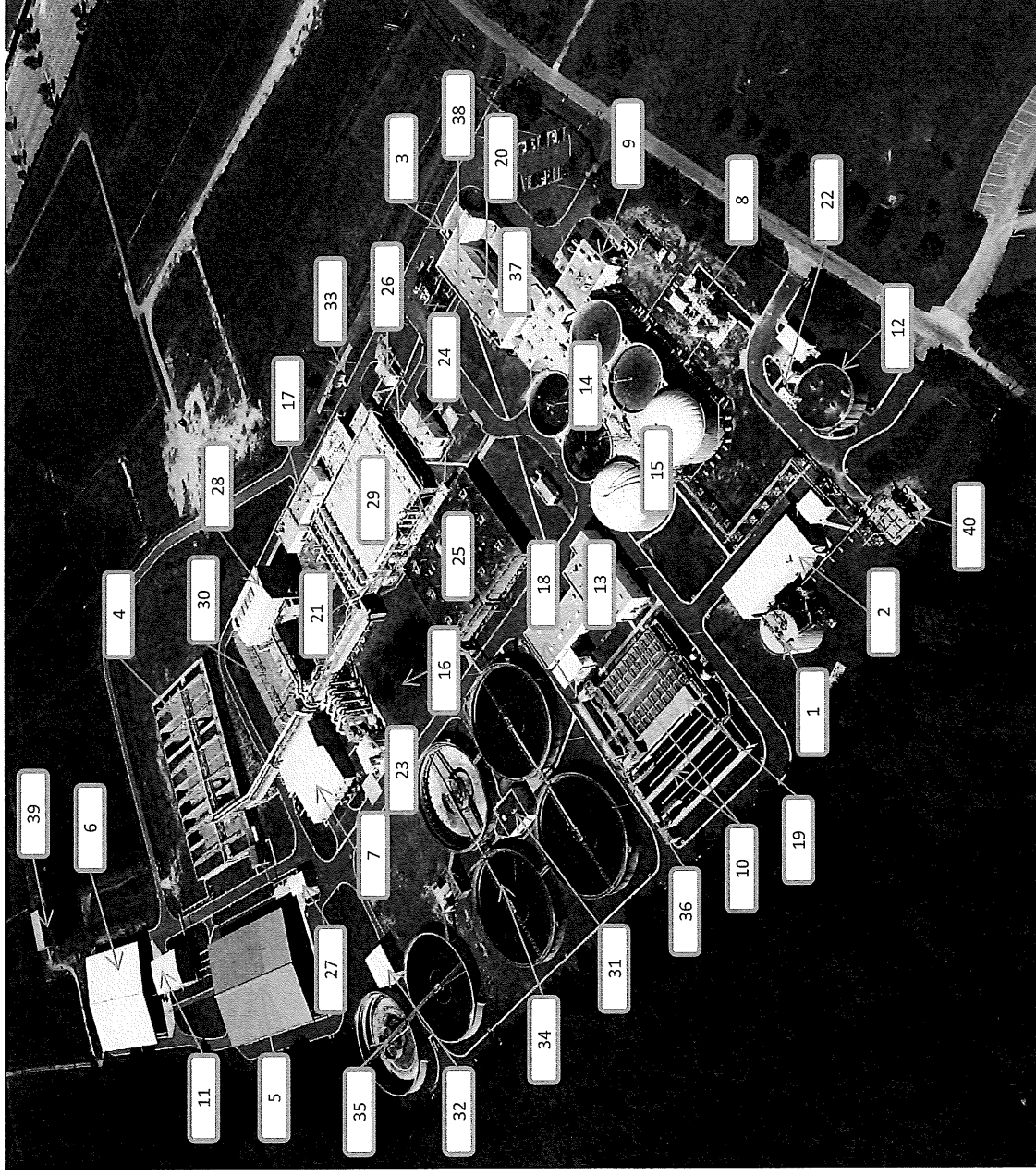
USGS Map Reference

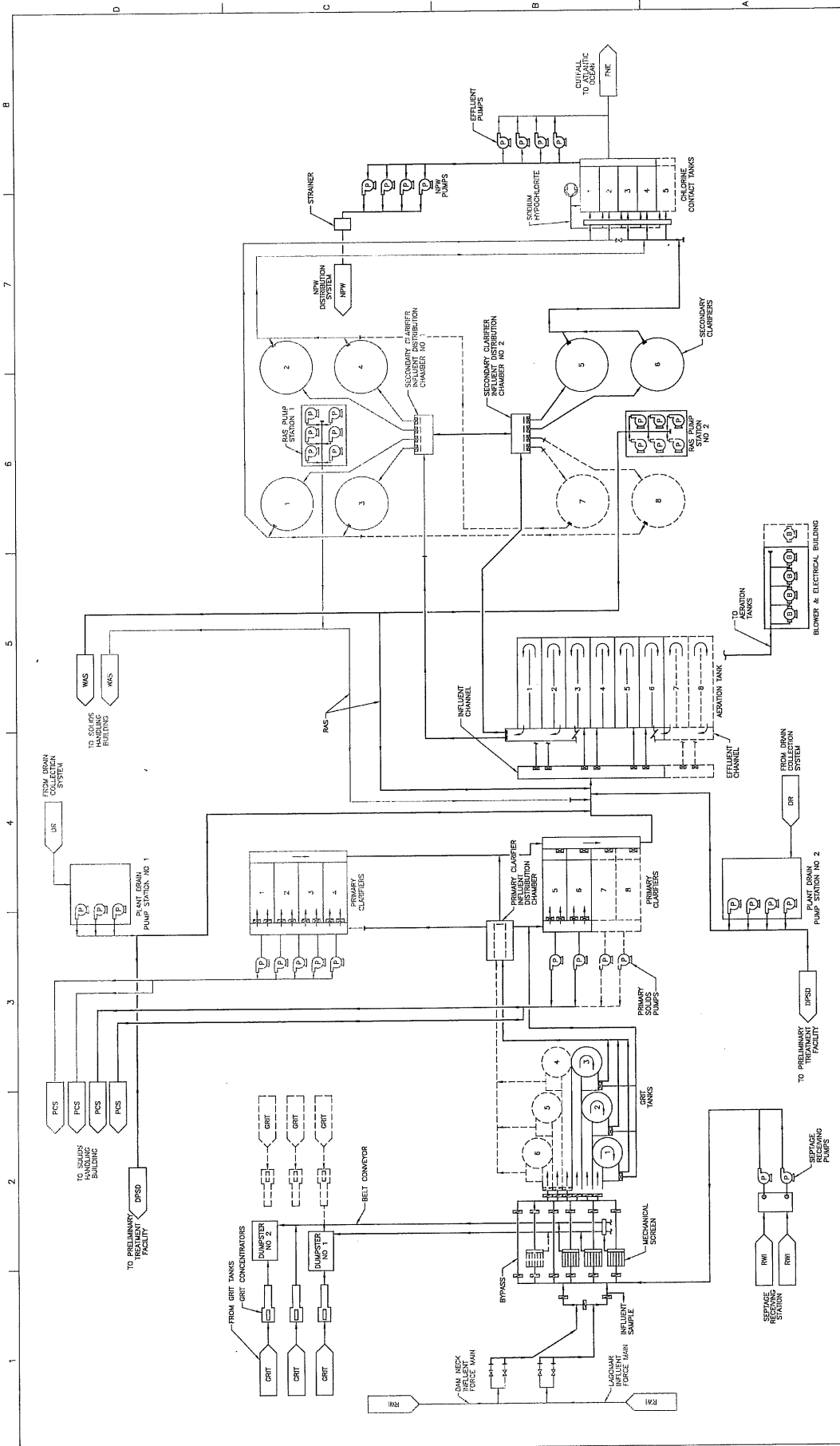
HRSD Atlantic Treatment Plant

645 Firefall Drive
Virginia Beach, VA 23454
757-821-7401

Facilities Directory

1. Acid Phase Digester
2. Acid Phase Digester Pumps and Boilers
3. Administration Building
4. Aeration Tanks 1 – 6
5. Biosolids Storage Pad No. 1
6. Biosolids Storage Pad No. 2
7. Blower – Electric Building
8. CHP – Biogas Cleaning System
9. CHP – Biogas Electric Generators
10. Contact Tanks 1 – 4
11. Dewatering Building
12. DSST Tank and Pump Station
13. Final Effluent Pumping Bldg
14. Gas Phase Digesters 1 – 4
15. Gas Phase Dystor Digesters 5 & 6
16. Grave Yard
17. Headworks 1983 & 1987
18. Hypochlorite Storage & Pumping
19. NPW Pump Station
20. Odor Control Station A
21. Odor Control Station B
22. Odor Control Station C
23. Odor Control Station D
24. Oxygen Plant (Out of Service)
25. Oxygen Aeration Tanks (Out of Service)
26. Plant Pump Station No. 1
27. Plant Pump Station No. 2
28. Preliminary Treatment Facility
29. Primary Clarifiers 1 – 4
30. Primary Clarifiers 5 & 6
31. RAS Pump Station No. 1
32. RAS Pump Station No. 2
33. Scale House
34. Secondary Clarifiers 1 – 4
35. Secondary Clarifiers 5 & 6
36. Sewage Treatment Shop
37. Solids Handling Building
38. Solids Handling Shop
39. Ware House
40. Waste Gas Flares





PROCESS FLOW DIAGRAM 1

FILENAME: 000-11.DWG
SCALE: NOT TO SCALE

SHEET 11 OF 825

HAMPTON ROADS SANITATION DISTRICT
VIRGINIA BEACH, VIRGINIA

ATLANTIC TREATMENT PLANT
EXPANSION PHASE I, CONTRACT C

PROJECT MANAGER: W. M. COY
DESIGNED BY: J. JACOBS
CHECKED BY: J. JACOBS
DATE: 3/22/93

PROJECT NUMBER: 21766

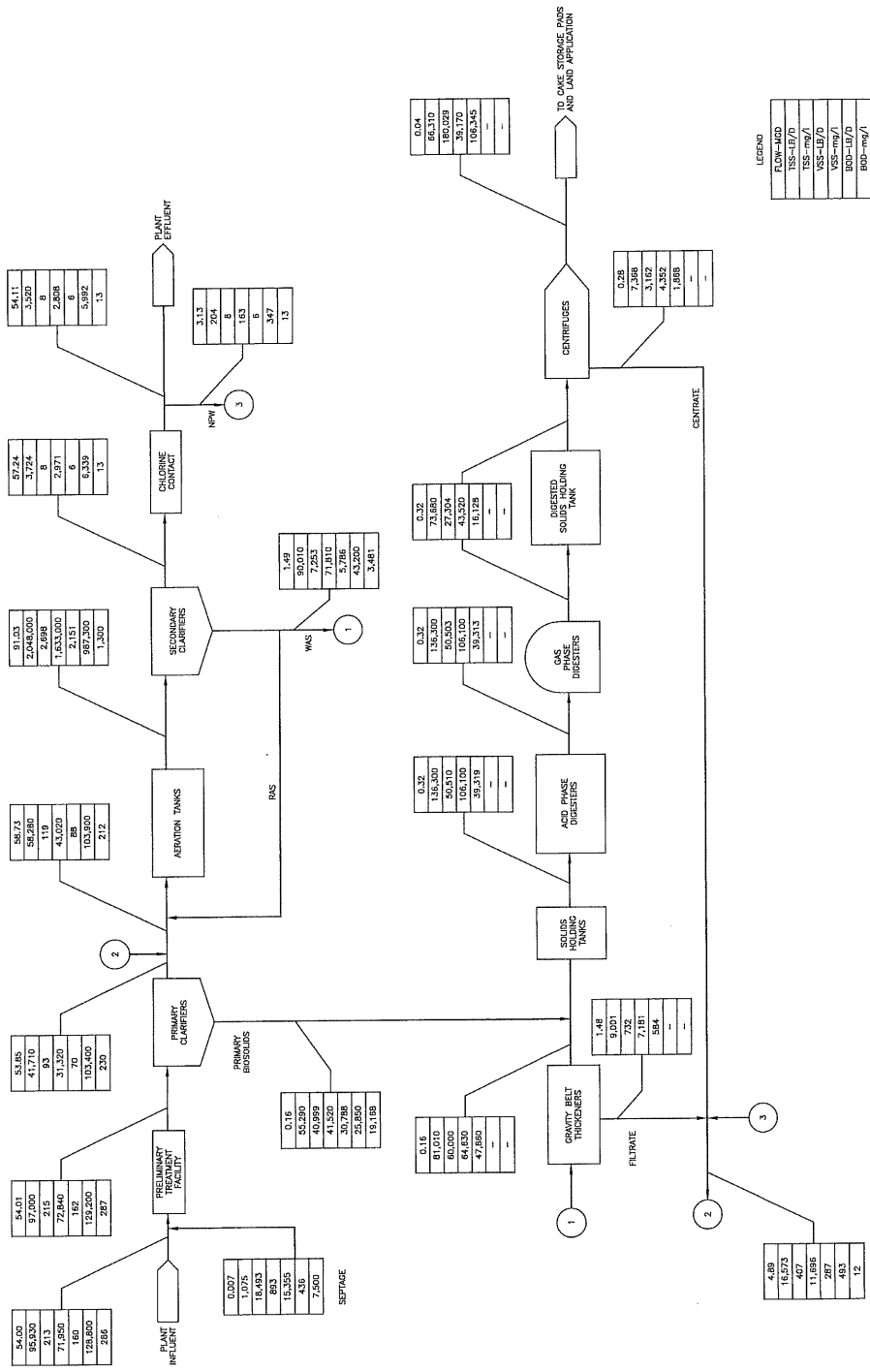
ISSUE: 11/06
DATE: 11/06
DESCRIPTION: ISSUED FOR BID

ISSUE: 11/06
DATE: 11/06
DESCRIPTION: ISSUED FOR BID

FDR
FDR Engineering, Inc.
2000 N. 10th St.
Virginia Beach, VA 23462

SEWAGE TREATMENT PLANT
PUMP STATION NO. 1
PUMP STATION NO. 2
PUMP STATION NO. 3
PUMP STATION NO. 4
PUMP STATION NO. 5
PUMP STATION NO. 6
PUMP STATION NO. 7
PUMP STATION NO. 8

1 2 3 4 5 6 7 8



HDR
1000 Pennsylvania Ave.
2000 14th Street NW
Washington, D.C. 20004

PROJECT MANAGER: W. JACOBY
DESIGNED BY: G. JACOBY
DRAWN BY: K. QUANTILLIUM
CHECKED BY: J. JACOBY

ISSUED FOR CONSTRUCTION
ISSUED FOR BID
DATE: 11/06
DATE: 02/07/08

PROJECT NUMBER: 21763

ATLANTIC TREATMENT PLANT
EXPANSION PHASE I, CONTRACT C

HAMPTON ROADS SANITATION DISTRICT
VIRGINIA BEACH, VIRGINIA

PROCESS MASS BALANCE DIAGRAM

DRAWING NUMBER: G-15
SHEET 15 OF 825

Atlantic STP Biosolids Data VA0081248

Section 8.A - Pollutant Concentrations

Parameter	Selenium	Arsenic	Molybdenum	Zinc	Lead	Nickel	Mercury	Copper	Cadmium
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
5/5/10	6	<14	13	1600	43	14	1.2	307	9
5/5/10	4	<12	11	1380	37	12	1.5	279	8
6/2/10	5	<14	12	1430	25	12	1.4	266	4
1/7/15	6	<19	12	1750	19	19	1.5	417	1.6
2/3/15	5	<21	12	1740	18	19	1.7	399	2.1
3/3/15	6	<21	9	1710	18	19	1.3	409	2.1
4/7/15	5	<17	12	1990	22	21	1.6	467	2
5/5/15	6	<20	10	1620	18	19	2.0	403	<1.6
6/2/15	4.91	<19	7	1620	19	20	1.6	352	1.9
7/7/15	6	<19	6	1460	20	17	1.2	323	<1.6
8/4/15	5.11	<19	8	1530	15	18	1.0	335	<1.6
9/1/15	5.39	<20	10	1370	13	16	1.3	331	<1.6
10/6/15	4.3	<19	12	1410	16	18	1.8	350	<1.6
11/3/15	5.05	<19	10	1430	16	18	1.2	342	1.6
12/1/15	5.12	<18	9	1540	16	17	1.0	339	1.5
Method	6020A	6010C	6010C	6010C	6010C	6010C	7471B	6010C	6010C
Report Limit (ug/l)	2.5	20	4	4	5	4	0.1	4	2

All values are on a dry weight basis.

FACILITY NAME: Atlantic STP

VPDES PERMIT NUMBER: VA0081248

9. Certification. Read and submit the following certification statement with this application. Refer to the instructions to determine who is an officer for purposes of this certification. Indicate which parts of the application you have completed and are submitting:

X Section A (General Information)

X Section B (Generation of Sewage Sludge or Preparation of a Material Derived from Sewage Sludge)

X Section C (Land Application of Bulk Sewage Sludge)

 Section D (Surface Disposal)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and official title Edward G. Henifin, P.E. General Manager

Signature  Date Signed 7/19/2016

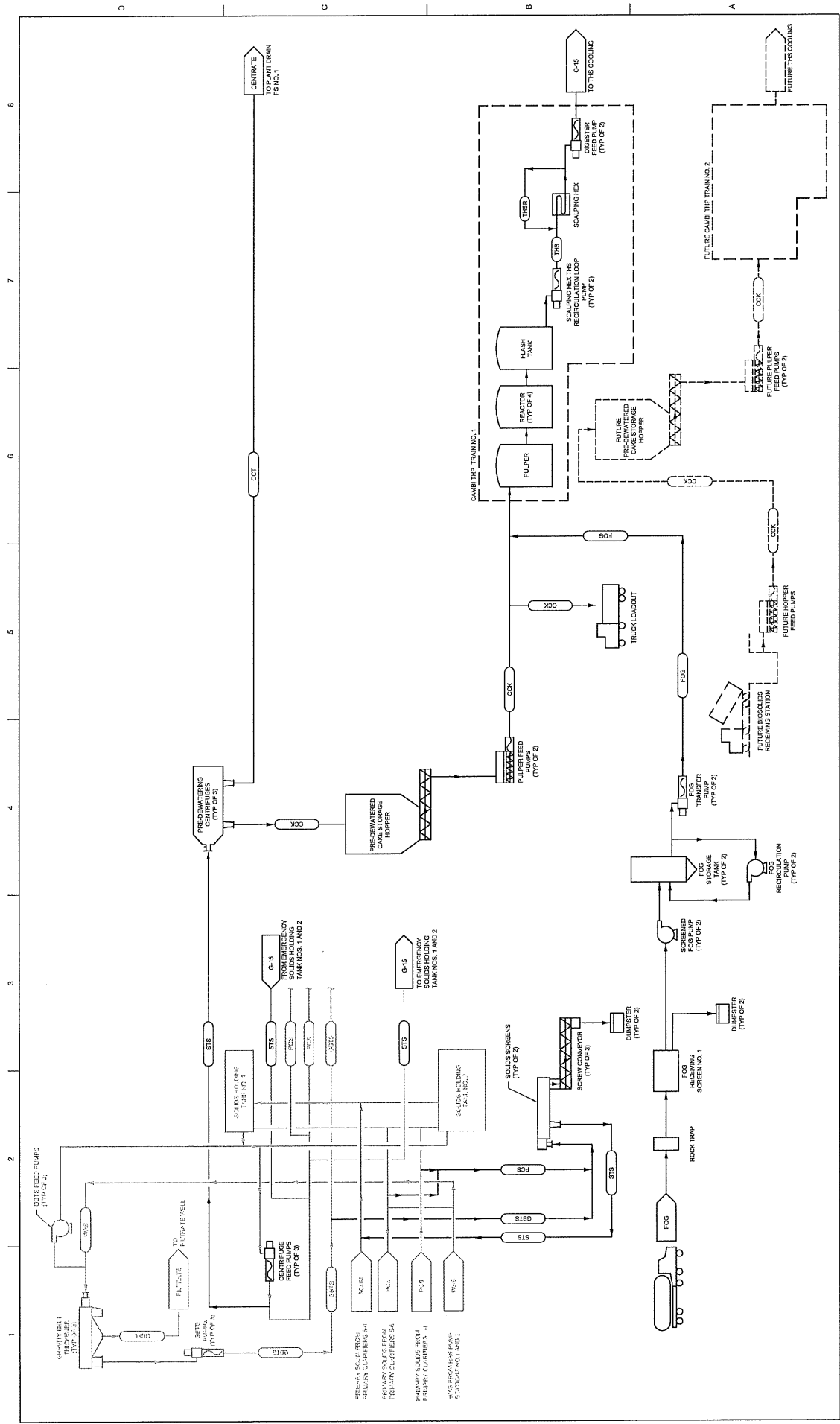
Telephone number 757-460-4242

Upon request of the department, you must submit any other information necessary to assess sewage sludge use or disposal practices at your facility or identify appropriate permitting requirements.

**SECTION B. GENERATION OF SEWAGE SLUDGE OR PREPARATION
OF A MATERIAL DERIVED FROM SEWAGE SLUDGE**

Complete this section if your facility generates sewage sludge or derives a material from sewage sludge

1. Amount Generated On Site.
Total dry metric tons per 365-day period generated at your facility: 3331 dry metric tons (2015 estimate)
2. Amount Received from Off Site. If your facility receives sewage sludge from another facility for treatment, use or disposal, provide the following information for each facility from which sewage sludge is received. If you receive sewage sludge from more than one facility, attach additional pages as necessary.
 - a. Facility name: HRSD Nansemond STP as an alternative backup plan
 - b. Contact Person: Jamie Mitchell
Title: Chief of Technical Services Division
Phone (757)-460-4220
 - c. Mailing address:
Street or P.O. Box: 1434 Air Rail Avenue
City or Town: Virginia Beach State: VA Zip: 23455
 - d. Facility Address:
(not P.O. Box)
 - e. Total dry metric tons per 365-day period received from this facility: 0 in 2015 dry metric tons
 - f. Describe, on this form or on another sheet of paper, any treatment processes known to occur at the off-site facility, including blending activities and treatment to reduce pathogens or vector attraction characteristics:
Solids are digested and dewatered to meet Class B pathogen requirement and the vector attraction requirements.
3. Treatment Provided at Your Facility.
 - a. Which class of pathogen reduction is achieved for the sewage sludge at your facility?
Class A ☒ Class B ☐ Neither or unknown
 - b. Describe, on this form or another sheet of paper, any treatment processes used at your facility to reduce pathogens in sewage sludge: Solids are digested between 15 days at 35 to 55 degrees Celsius and 60 days at 20 degrees Celsius
 - c. Which vector attraction reduction option is met for the sewage sludge at your facility?
☒ Option 1 (Minimum 38 percent reduction in volatile solids)
☐ Option 2 (Anaerobic process, with bench-scale demonstration)
☐ Option 3 (Aerobic process, with bench-scale demonstration)
☐ Option 4 (Specific oxygen uptake rate for aerobically digested sludge)
☐ Option 5 (Aerobic processes plus raised temperature)
☐ Option 6 (Raise pH to 12 and retain at 11.5)
☐ Option 7 (75 percent solids with no unstabilized solids)
☐ Option 8 (90 percent solids with unstabilized solids)
☐ None or unknown
 - d. Describe, on this form or another sheet of paper, any treatment processes used at your facility to reduce vector attraction properties of sewage sludge: The primary VAR option is VAR Option 1. If 38% reduction is not met, then biosolids are incorporated into the soil within 6 hours of application.
 - e. Describe, on this form or another sheet of paper, any other sewage sludge treatment activities, including blending, not identified in a - d above:
Cambi Thermal Hydrolysis Sludge Pre-treatment
HRSD is in the design process for upgrading our Class B biosolids production process to become a Class A Exceptional Quality biosolids fertilizer production facility. The tentative project schedule proposes construction in 2017-2018, with Class A Exceptional Quality biosolid fertilizer production by April 30, 2019, and final completion by August 2020.
Cambi is a high-pressure steam pre-treatment for anaerobic digestion that breaks down the solids before the digestion process. The solids are "pressure cooked" at 165 C (329 F) for 20 minutes at 87 psi. This is an anaerobic process, utilizing raised temperature for pathogen destruction to generate a pathogen free biosolids product with increased cake dewaterability. The Exceptional Quality Class A biosolids fertilizer product will be marketed and/or distributed in bulk and/or bags for public use in accordance with 9 VAC 25-32-570 Distribution and Marketing and will be registered with the Virginia Department of Agriculture and Consumer Services in accordance with the provisions of § 3.2-3607 of the Code of Virginia.
See Attachments containing Cambi THP details, and proposed plant schematics including this process, which will produce Class A Exceptional Quality biosolids on/after 4/30/2019.



PROJECT MANAGER: W. LLOYD
DESIGNED BY: D. BRIDLE
DRAWN BY: T. LORRY

ISSUE DATE DESCRIPTION

60% SUBMITTAL

PROJECT NUMBER: 24002

OVERALL SOLIDS PROCESS FLOW DIAGRAM 1

HAMPTON ROADS SANITATION DISTRICT
VIRGINIA BEACH, VIRGINIA

ATLANTIC TREATMENT PLANT
THP AND FOG RECEIVING STATION

DWG NO. G-14

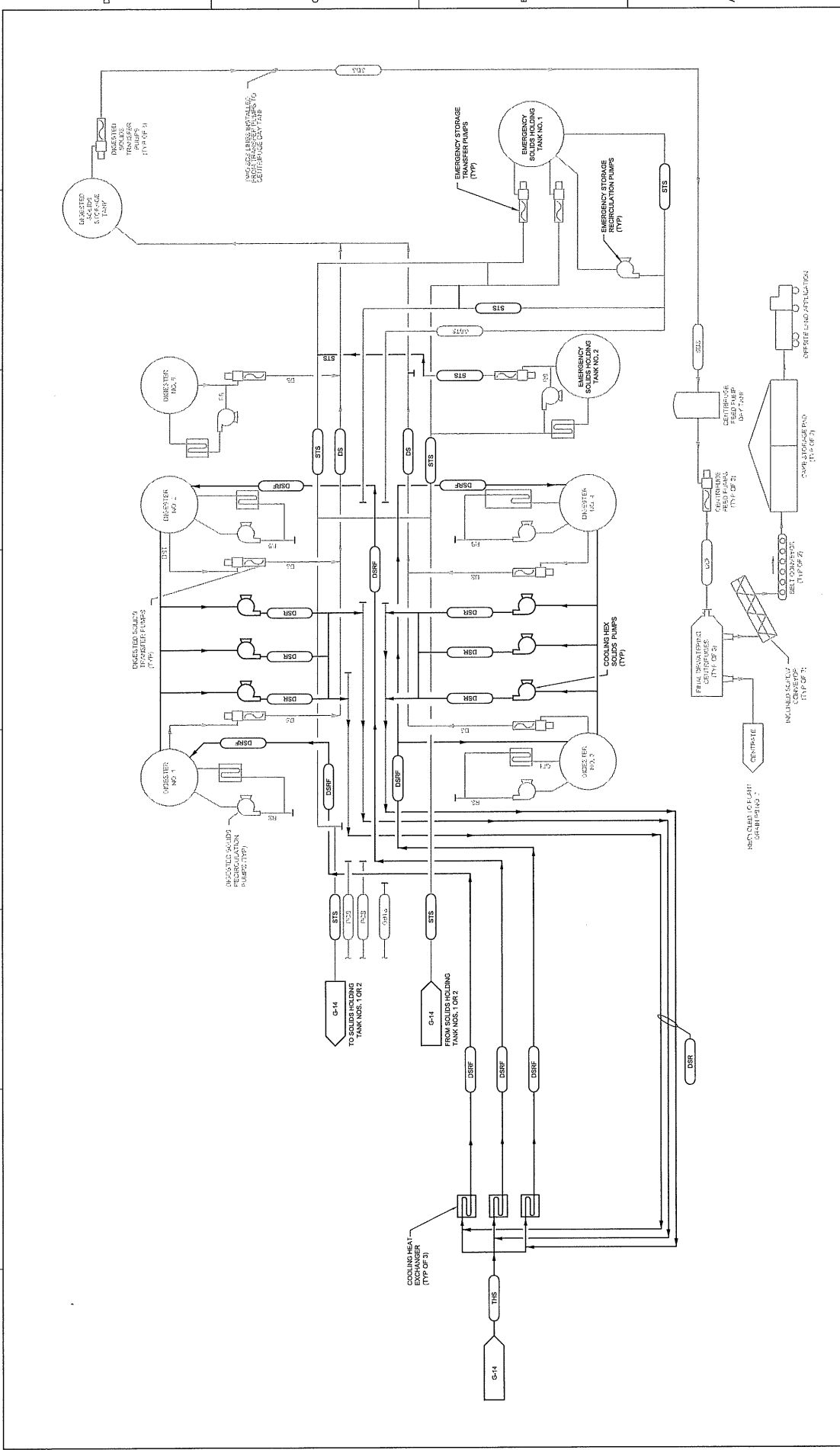
SHEET G-14

FILE NAME G-14.DWG

SCALE NONE

DATE 2/4/2016 7:49:27 AM, TLOKEY

1 2 3 4 5 6 7 8



HCR

PROJECT MANAGER: W. JACOBY

DESIGNED BY: B. SWANSON

DRAWN BY: T. LOKEY

ISSUE: 1

DATE: 12/15/2016

DESCRIPTION: 12/15/2016

60% SUBMITTAL

HAMPTON ROADS SANITATION DISTRICT
VIRGINIA BEACH, VIRGINIA

ATLANTIC TREATMENT PLANT
THP AND FOG RECEIVING STATION

OVERALL SOLIDS PROCESS FLOW DIAGRAM 2

SHEET: G-15

SCALE: NONE

DWG NO.: 1290582



Turbocharge Your Digester

Technology for Enhanced Anaerobic Digestion of Municipal and Industrial Sludge



+
Increased Renewable Energy
Reduced Biosolids Volume

Unleash the Power of Anaerobic Digestion

Cambi Thermal Hydrolysis Sludge Pre-treatment

Cambi's Thermal Hydrolysis Process (THP) is a proven and reliable technology that has been used around the world since 1995 in existing and "green field" projects to reduce both disposal quantities and the cost of building and operating digesters.

Cambi THP is a high-pressure steam pre-treatment for anaerobic digestion of municipal and industrial sludge and bio-waste. Applying THP technology results in doubled digester loading, increased biogas production, and a pathogen-free and stabilized biosolids product with increased cake dewaterability. This saves both transport and energy costs, whether applying the end product directly in agriculture or drying it for fertilizer or bio-fuel.

The THP is highly energy-efficient with low operating costs. It also eliminates odour problems associated with the treatment of organic materials. The end product (digestate) – a pathogen free and pasteurized biosolids – can be applied to land directly, composted or dried.

Cambi THP plants can be combined with cogeneration plants, which produce green electricity and provide hot steam for the Thermal Hydrolysis Process. However, the biogas can also be cleaned to be used as vehicle fuel or as a replacement of natural gas.

Cambi's scope of delivery varies from the core THP to complete turnkey digestion plants. We also offer plant operations & maintenance. The THP plants normally handles sludge from wastewater treatment plants for populations upwards from 150,000, or from approximately 5,000 metric tons/year of sludge.

Cambi's THP enhanced sludge treatment maximise both flexibility and profitability.

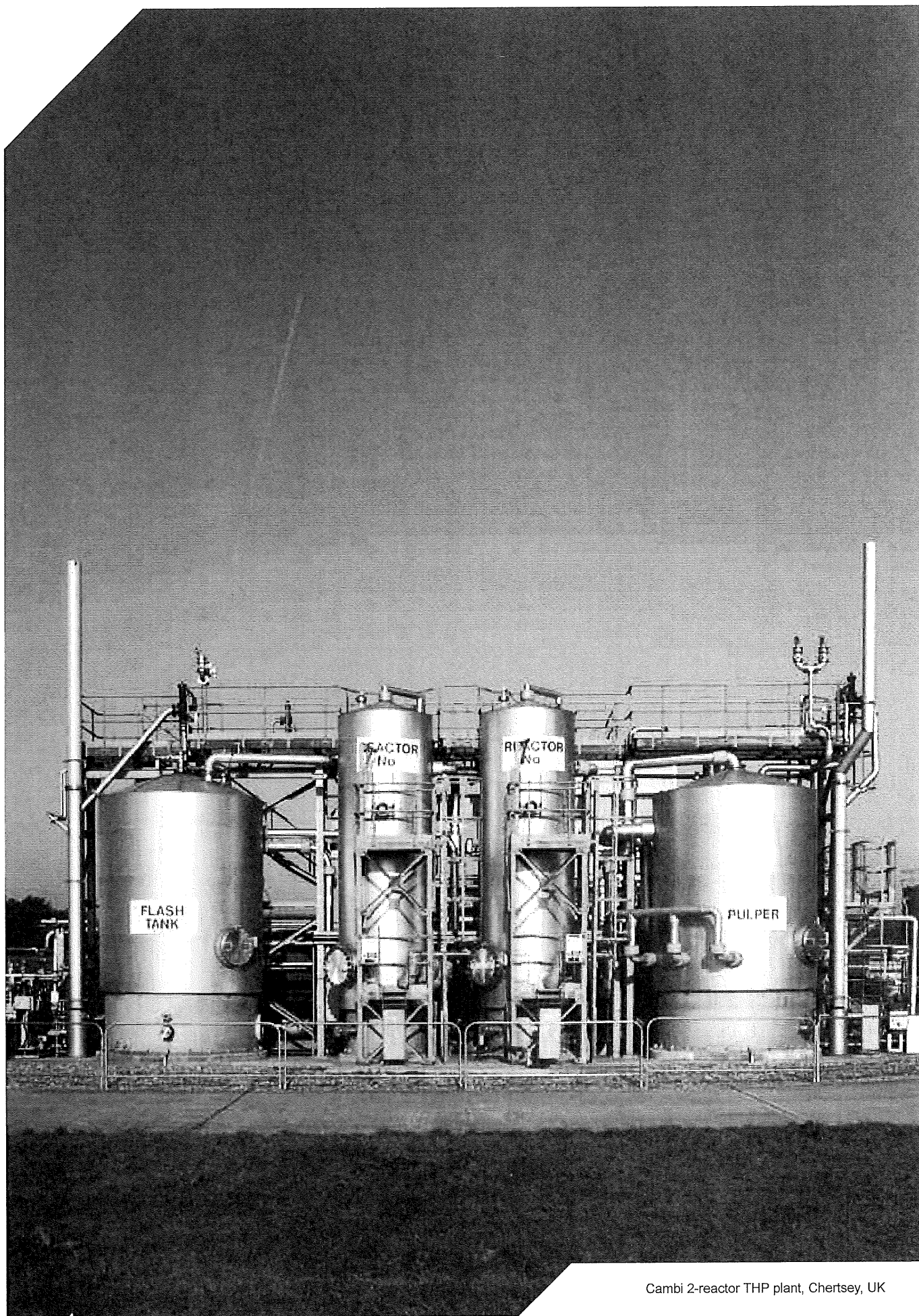
For additional information please visit: www.cambi.com

“ *Sludges that were difficult and expensive to dispose have been transformed into biosolids whose values are appreciated by those who receive them for recycling. Costs have been reduced dramatically and payback has been rapid.”*

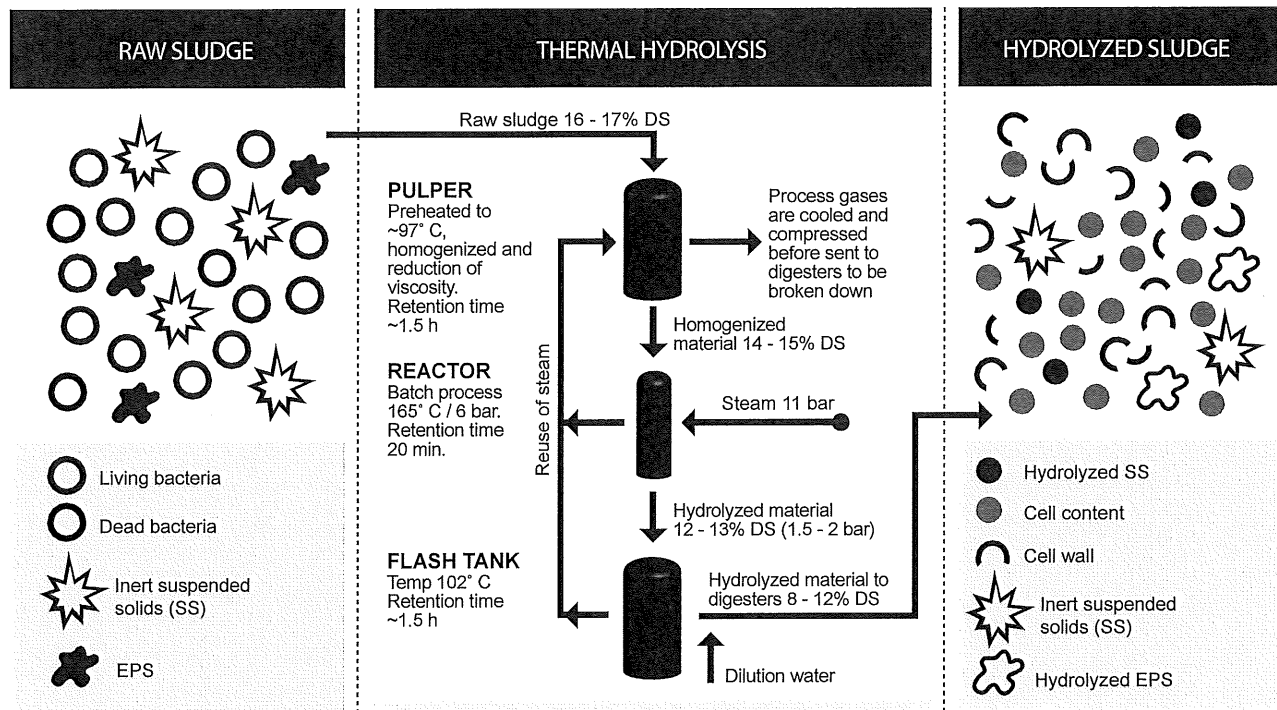
Næstved and Fredericia WWTPs, Denmark



Cambi 4-reactor THP plant, Cotton valley
Milton Keynes, UK



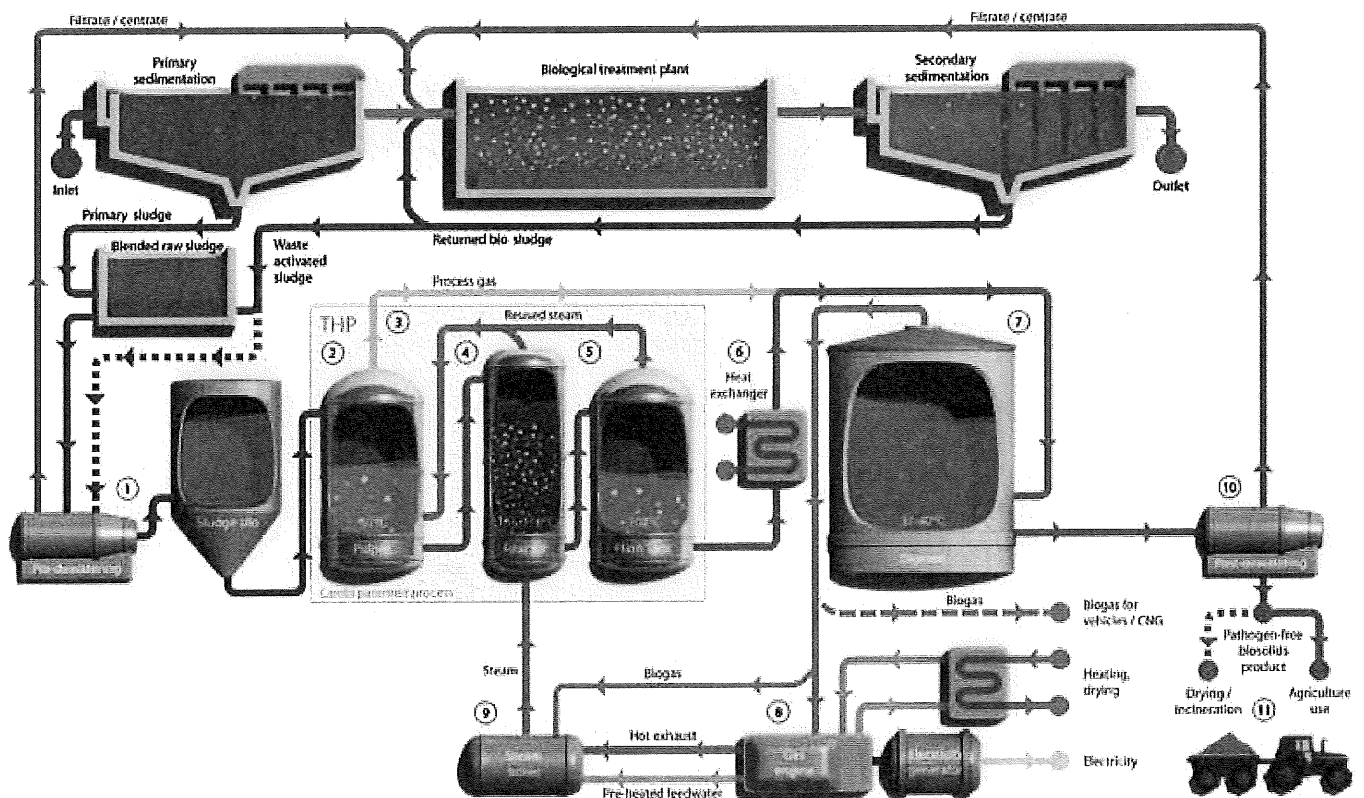
Cambi 2-reactor THP plant, Chertsey, UK



What is Thermal Hydrolysis, and what does it do?

- Disintegrates cell structure/organic materials and dissolves naturally occurring cell polymers (exopolymeric substances - EPS), a form of protein, into an easily digestible feed for anaerobic digestion
- The resulting less viscous (more fluid) sludge allows doubling of digester dry solids (DS) loading with stable operations
- Increases sludge and bio-waste biodegradability and therefore yields more biogas
- Better dewatering - up to 40% total dry solids - by releasing water bound in EPS (EPS binds 4 - 5 g water / g EPS). This gives less biosolids after digestion and dewatering
- Produces an efficient and pathogen-free fertilizer: Treating the material at 165° C for 20 minutes meets all known standards and requirements for sterilisation, including the EU Animal By Products Regulation (ABPR, 1774/2002/EC) category II & III materials

The Cambi Thermal Hydrolysis Process (THP)



“ The engine's waste-heat is used to supply heat for the boiler that drives the THP process, so it's very energy efficient. ... The farmers know we have a very high treatment standard and are happy to keep taking the sludge cake as it's a great fertilizer and does not smell.”

HIAS WWTP, Hamar, Norway

Process Flow

1. Sludge is dewatered to 16-17% dry solids (DS) and led to a storage silo.
2. The dewatered sludge is fed into the pulper to be mixed and heated by recycled steam from the reactor(s) and the flash tank.
3. Process gases are compressed and broken down biologically in the digesters (no odour).
4. Thermal hydrolysis takes place in reactor(s) at 165°C for 20-30 minutes. The steam is gradually released and sent back to the pulper (2).
5. The sterilized sludge is then passed rapidly into the flash tank, resulting in cell destruction from the pressure drop. The sludge temperature is decreased to approximately 102° C by flashing steam back to the pulper.
6. The sludge is then cooled to the required digestion temperature partly by adding dilution water and partly in the heat exchangers.
7. The THP process is followed by anaerobic digestion, converting the organic matter (volatile solids) to biogas, mainly consisting of approximately 65% methane (CH_4) and 35% carbon dioxide (CO_2).
8. The biogas can be utilised in a gas engine with generator producing electricity. Alternatively it is cleaned (stripped) of CO_2 and used to substitute natural gas in gas grid/vehicles.
9. Steam for thermal hydrolysis is mainly produced in a cogeneration waste-heat boiler using exhaust gas and cooling water from the gas engine. Alternatively, biogas or other fuel sources can be used.
10. The digested sludge is dewatered into a high-class biosolids product with 30 – 40% dry solids.
11. The resulting cake/biosolids is applied directly on agricultural land or dried and used as fuel or bio-fertilizer.

Why Thermal Hydrolysis?

Enhanced biogas production

- 50-65% of the organic matter (Volatile Solids – VS) in sludge converted to biogas
- High quality biogas, rich in methane, low in H_2S
- Ideal for green electricity, as renewable vehicle fuel, or substitute for natural gas

Improved dewaterability after digestion by 50% - 100%

- Dewatering up to 40% DS (dry solids)
- Less material handling/transport
- Significant mass reduction
- Less water evaporation for sludge drying
- Digested and dewatered Cambi cake stockpiles and composts easily without any additional structural material

Pasteurization and stabilization of final biosolids product/cake

- Thermal treatment at 165°C for 20-30 minutes before digestion eliminates all pathogens
- No regrowth or reactivation of bacteria
- Increased stabilization of cake after digestion due to high organic matter conversion

The digested sludge has no negative odour

- Odour nuisances prevented due to the closed process cycle

Highly energy-efficient and reliable process

- Maximum reuse of steam in thermally insulated vessels
- Maximum dry-solids feed (16-17% DS) to the Thermal Hydrolysis Process
- Thermal energy use is thus comparable or even less than other methods of pasteurization
- Direct steam injection avoids clogging and unexpected shut downs of heat exchangers

Lower retention time and higher dry-solids content in digesters

- Reduced viscosity from thermal hydrolysis (making the sludge more fluid)
- Digesters can be fed with a sludge concentration of 8-12% dry solids (DS), twice that of a conventional digester
- Increased speed of digestion
- Together these factors increase digester capacity 2-3 times, with loading rates up to 6kg/m³/day of organic matter

Robust anaerobic digestion process

- Ideal feed for anaerobic digestion; consistent and free of unwanted micro-organisms
- Elimination of foam-causing filamentous bacteria
- High alkaline buffering capacity
- High active biomass concentration

Compact design makes THP easy to retrofit to existing sludge treatment plants

Existing digester assets can be used to treat sludge or other biowastes from a wider region without further investment

- Existing digester systems can be fed at more than double conventional rates, thus increasing the capacity of existing plants or minimising capital expenditure for new digesters

Cambi™ THP vs. Conventional Anaerobic Digestion

INCREASED DIGESTER YIELD

Conventional



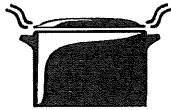
Cambi THP



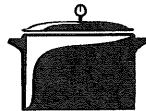
- 2-3 times enhanced digester capacity
- Per m³ digester volume:
 - 3.5 m³ biogas/day
 - load up to 6 kg VS/day

ENERGY EFFICIENT AND CLOSED PASTEURIZATION

Conventional



Cambi THP



- All steam recycled – comparable to heating sludge to 102° C
- High dry-solids feed (16-17% DS)

INCREASED BIOGAS PRODUCTION

Conventional



Cambi THP



- 30-100% more biogas production than conventional technology

HIGH CLASS BIOSOLIDS/ FERTILIZER

Conventional



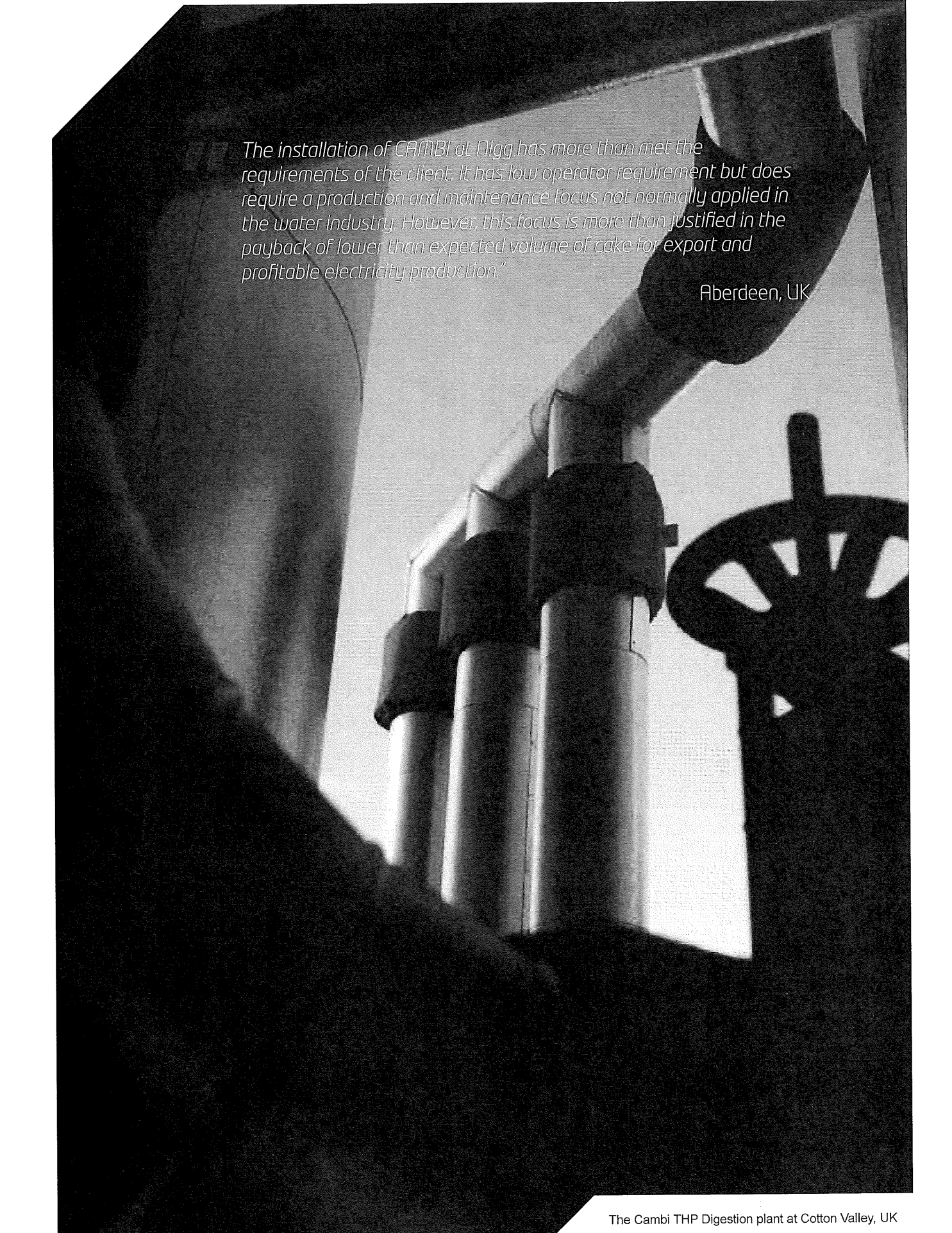
Cambi THP



- 50% mass reduction after dewatering
- Recycling of resources
- Class A / 100% pathogen destruction

“ The Dublin THP digestion plant ... can produce 3.5m³/day of biogas per m³ of digester capacity, which is 350% of the normal situation.”

Dublin, Ireland



The installation of CAMBI at Nigg has more than met the requirements of the client. It has low operator requirement but does require a production and maintenance focus not normally applied in the water industry. However, this focus is more than justified in the payback of lower than expected volume of cake for export and profitable electricity production."

Aberdeen, UK

The Cambi THP Digestion plant at Cotton Valley, UK

Advantages of Cambi Thermal Hydrolysis

- Increased sludge bio-degradability and therefore more biogas production
- Significant sludge cake volume reduction
- Higher digestion rate and 8 – 12% dry solids feed to digestion increases digester capacity two to three times
- Stable and reliable digester operation
- Highly energy-efficient process
- Eliminates foaming problems caused by filamentous bacteria (Nocardia, etc.)
- Sludge dewaterability improved up to 40% dry solids
- Pasteurized cake: Guarantee of pathogen kill (class A biosolids) with no regrowth or reactivation of bacteria
- Proven process: Cambi THP has been used in projects around the world since being launched in 1995 to reduce both disposal quantities and the cost of building and operating digesters



The Pathogen-free nutritious biosolids product can be used as organic fertiliser in agriculture, or as soil improver

MD010510

“ *The average dry solids content of the sludge increased from an average of 20% in 2004 to 31% in 2006, within the first full year of Cambi THP operations.... Cake production decreased to less than half.... No load change occurred in the wastewater treatment plant within the same period”.*

Kapusciska WWTP, Bydgoszcz, Poland



CAMBI™

Main office: Cambi AS, Skysstasjonen 11A, 1383 Asker, Norway
Mailing address: PO Box 78, 1371 Asker, Norway
Tel: +47 66 77 98 00 – www.cambi.com

4. Preparation of Sewage Sludge Meeting Ceiling and Pollutant Concentrations, Class A Pathogen Requirements and One of Vector Attraction Reduction Options 1-8 (EQ Sludge). **Not applicable**
(If sewage sludge from your facility does not meet all of these criteria, skip Question 4.)
- a. Total dry metric tons per 365-day period of sewage sludge subject to this section that is applied to the land: dry metric tons
- b. Is sewage sludge subject to this section placed in bags or other containers for sale or give-away?
 Yes No
5. Sale or Give-Away in a Bag or Other Container for Application to the Land. **Not applicable**
(Complete this question if you place sewage sludge in a bag or other container for sale or give-away prior to land application. Skip this question if sewage sludge is covered in Question 4.)
- a. Total dry metric tons per 365-day period of sewage sludge placed in a bag or other container at your facility for sale or give-away for application to the land: dry metric tons
- b. Attach, with this application, a copy of all labels or notices that accompany the sewage sludge being sold or given away in a bag or other container for application to the land.
6. Shipment Off Site for Treatment or Blending. *Alternative Emergency Plan*
(Complete this question if sewage sludge from your facility is sent to another facility that provides treatment or blending. This question does not apply to sewage sludge sent directly to a land application or surface disposal site. Skip this question if the sewage sludge is covered in Questions 4 or 5. If you send sewage sludge to more than one facility, attach additional sheets as necessary.)
- a. Receiving facility name: McGill Environmental Systems of NC Inc.
- b. Facility contact: Sean Fallon
Title: Manager
Phone: 919-406-4270
- c. Mailing address:
Street or P.O. Box: 5056 Beef Steak Road
City or Town: Waverly State: VA Zip: 23890
- d. Total dry metric tons per 365-day period of sewage sludge provided to receiving facility: 0 dry metric tons
- e. List, on this form or an attachment, the receiving facility's VPDES permit number as well as the numbers of all other federal, state or local permits that regulate the receiving facility's sewage sludge use or disposal practices:
Permit Number: VPA00837 Type of Permit: Biosolids Use Facility Operation Permit
- f. Does the receiving facility provide additional treatment to reduce pathogens in sewage sludge from your facility? X Yes No
Which class of pathogen reduction is achieved for the sewage sludge at the receiving facility?
 X Class A Class B Neither or unknown
Describe, on this form or another sheet of paper, any treatment processes used at the receiving facility to reduce pathogens in sewage sludge: Aerated static pile composting which blends wood chips and wastewater treatment solids.
- g. Does the receiving facility provide additional treatment to reduce vector attraction characteristics of the sewage sludge? X Yes No
Which vector attraction reduction option is met for the sewage sludge at the receiving facility?
 Option 1 (Minimum 38 percent reduction in volatile solids)
 Option 2 (Anaerobic process, with bench-scale demonstration)
 Option 3 (Aerobic process, with bench-scale demonstration)
 Option 4 (Specific oxygen uptake rate for aerobically digested sludge)
 X Option 5 (Aerobic processes plus raised temperature)
 Option 6 (Raise pH to 12 and retain at 11.5)
 Option 7 (75 percent solids with no unstabilized solids)
 Option 8 (90 percent solids with unstabilized solids)
 None unknown
Describe, on this form or another sheet of paper, any treatment processes used at the receiving facility to reduce vector attraction properties of sewage sludge: Solids are treated in aerobic process for at least 14 days. During the time, the minimum temperature of the solids is higher than 40 degrees Celsius and the average temperature exceeds 45 degrees Celsius

VPDES PERMIT NUMBER: VA0081248

7. Land Application of Bulk Sewage Sludge.
(Complete Question 7.a if sewage sludge from your facility is applied to the land, unless the sewage sludge is covered in Questions 4, 5 or 6; complete Question 7.b, c & d only if you are responsible for land application of sewage sludge.)

8. Surface Disposal. *Not applicable*
(Complete Question 8 if sewage sludge from your facility is placed on a surface disposal site.)

- _____



NOTICE AND NECESSARY INFORMATION (NANI)

Facility: Atlantic Treatment Plant

Biosolids Type: Anaerobically Digested

Monitoring Period: From: _____ To: _____

A. Pathogen Reduction (40 CFR.503.32) – Indicate the level achieved:

Class B*

*Temperature between 35 degrees C to 55 degrees C (95 – 131 degrees F) at 15 days and 20 degrees C (68 degrees F) at 60 days.

Comments: _____

B. Vector Attraction Reductions (40 CFR.503.33) – Indicate the option performed:

- ☐ Option 1 Meet 38% reduction in volatile solids content
- ☐ Option 2 Demonstrate vector attraction reduction with additional anaerobic digestion in a bench-scale unit
- ☐ Option 3 Demonstrate vector attraction reduction with additional aerobic digestion in a bench-scale unit
- ☐ Option 4 Meet a specific oxygen uptake rate for aerobically digested biosolids
- ☐ Option 5 Compost processes at greater than 40°C for 14 days or longer.
- ☐ Option 6 Alkali addition under specified aconditions
- ☐ Option 7 Dry biosolids with unstabilized solids to at least 75 percent solids
- ☐ Option 8 Dry biosolids with unstabilized solids to at least 90 percent solids
- ☐ Option 9 Inject biosolids beneath the soil surface
- ☐ Option 10 Incorporate biosolids into the soil within 6 hours of application to or placement on the land

Comments: _____

C. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or these persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and Official Title: Plant Manager	Area Code and Telephone Number:
Signature: .	Date Signed:

B.6.j

McGILL
SoilBuilder
Premium Compost

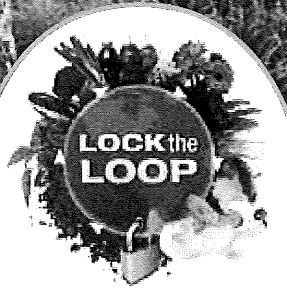
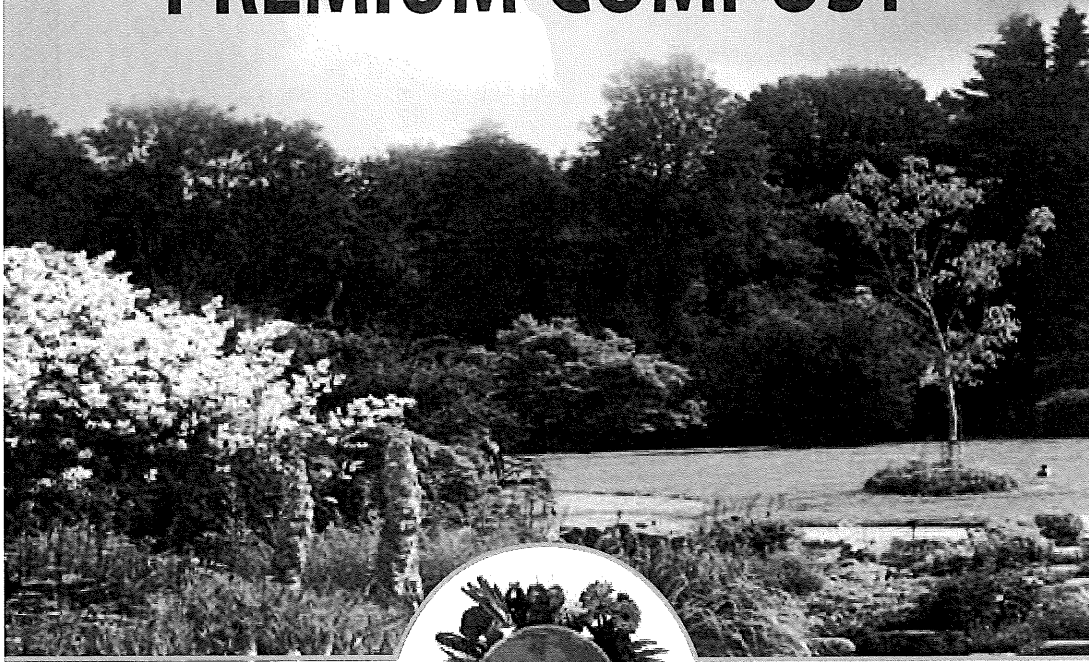
PREMIUM COMPOST

SAVES WATER | SAVES MONEY

McGILL **SoilBuilder**
Premium Compost

Lawns | Trees & Shrubs
Flower & Vegetable Gardens

PREMIUM COMPOST



US Composting Council
Seal of Testing Assurance
STA-Certified



McGillSoilBuilder.com

1 cubic foot

PREMIUM COMPOST

McGILL **SoilBuilder**
Premium Compost

GIVE YOUR SOIL WHAT IT REALLY WANTS!

How much do you need?

At 1/4 inch deep:	
1 bag covers ±48 sq. ft.	
5 bags cover ± 240 sq. ft.	
20 bags cover ± 960 sq. ft.	
At 1 inch deep:	
1 bag covers ±12 sq. ft.	
5 bags cover ± 60 sq. ft.	
20 bags cover ± 240 sq. ft.	

✓	Fewer chemicals	Create healthier soil structure and increase organic matter essential to key soil processes and organisms
✓	Less Water for More Savings where you need it	Improve growing conditions by boosting the water-holding capacity of your soil and keeping more moisture at the root zone
✓	Improved drainage	Reduce the impact of over-watering or water-logging after heavy rain through increased pore space, allowing water to percolate quickly
✓	Slow release	Get more nutrients to the root zone and hold them there for slow release through high Cation Exchange Capacity (CEC)

For lawns. For new lawns, till in 2 inches of compost to a depth of 6-8 inches. For established lawns, topdress 1/8 to 1/4 inch of compost and core aerate to increase organic matter. For bare patches, sprinkle over spot, seed, rake and water-in.

For fruits and vegetables. Apply 1-2 inches. Incorporate to a depth of 6-8 inches, plant and water. Can be used as a garden mulch, too.

For planting beds, containers. Use up to one-third compost in raised beds, but do not exceed 30% in container mixes. For established container plants, sprinkle over soil and water-in. Compost holds moisture, so avoid over-watering.

For trees and shrubs. Mix 1 part SoilBuilder with 2 parts soil saved from the planting hole. Use as backfill. Water thoroughly.

Ingredients — 100% recovered materials

McGill's manufacturing process recycles a wide variety of residuals and byproducts and includes (but is not limited to) materials like green waste and woody materials (pallets, lumber, manufacturing byproducts), charcoal and wood ash, paper and cardboard, gypsum products, food waste, animal manures and bedding, and sludge resulting from food processing and the treatment of drinking water and wastewater (biosolids). Products containing biosolids compost are manufactured and tested to meet or exceed standards for Class A compost as defined by the Environmental Protection Agency (EPA) and the state of distribution.

Self-pasteurized

EPA Exceptional Quality



TRUE SUSTAINABILITY BEGINS AND ENDS WITH COMPOST.

Hold moisture
Rebuild topsoil
Water less often
Add organic matter
Improve percolation



STA-certified premium compost

Questions?

McGill | Compost Products
PO 61, Harrells, NC 28444
TEL: 910-532-2539
FAX: 910-532-2542
FAQ@mcgillcompost.com
mcgillcompost.com



SCAN QR CODE

McGill Soil Builder is the base ingredient of all McGill product formulations which is sold by volume with a net weight of 40 lbs. (18 kg). This compost product has been sampled and tested as required by the Seal of Testing Assurance Program of the United States Composting Council (USCC). Test results are available upon request by calling McGill at 910-532-2539, on our website, or by contacting a McGill representative. The USCC makes no warranties regarding this product or its contents, quality, or suitability for any particular use. Compost is a concentrated soil amendment. Use only as directed. McGill does not guarantee nutrient content of this product or your results.



McGILL PREMIUM COMPOST
The compost people^{ch}



This bag is
Landfill Biodegradable
and Recyclable with
other plastics

Safety Data Sheet
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1. Identification

1.1. Product identifier

Product Identity

McGill **SoilBuilder** compost

Alternate Names

McGill **SoilBuilder** compost

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use

See Technical Data Sheet.

Application Method

See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Company Name

McGill Environmental Systems of N.C., Inc.
634 Christian Chapel Church Road
New Hill, NC 27562

Emergency

CHEMTREC (USA)

(800) 424-9300

Customer Service: McGill Environmental Systems of N.C., Inc.

919-362-1161

2. Hazard(s) identification

2.1. Classification of the substance or mixture

No applicable GHS categories.

2.2. Label elements

Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows.

No applicable GHS categories.

[Prevention]:

No GHS prevention statements

[Response]:

No GHS response statements

[Storage]:

No GHS storage statements

[Disposal]:

No GHS disposal statements

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3. Composition/information on ingredients

There are no ingredients in this product which are classified as hazardous, and/or no hazardous ingredients above the GHS cut off percentage.

Product contains 100% recycled organic residuals and by-products including (but not limited to) materials like green waste and woody materials (pallets, lumber, coal and manufacturing by-products), charcoal and wood ash, paper and cardboard, gypsum products, food waste, animal manures and bedding, and sludge resulting from food processing and the treatment of drinking water and wastewater (biosolids). Products containing biosolids compost are manufactured and tested to meet or exceed standards for Class A compost as defined Environmental Protection Agency (EPA) and the state of distribution.

This product is not considered to be hazardous in accordance with the OSHA Hazard Communication Standard 29 CFR 1910.1200, Health Hazard. See product label for product-specific information.

4. First aid measures

4.1. Description of first aid measures

General	In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.
Inhalation	Remove to fresh air
Eyes	Irrigate copiously with clean water for at least 15 minutes, holding the eyelids apart and seek medical attention.
Skin	Wash dust away. Keep open wounds covered and clean as suggested by any good program of hygiene.
Ingestion	If swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Overview	IRRITANCY: Inhalation of dust may cause irritation of nose, throat, and lungs. Eye contact with solids may produce irritation, tearing or blinking as a foreign body in the eye. SENSITIZATION: Skin sensitivity may occur with allergic individuals. First aid consists of washing dust away. INGESTION: No hazard from unused material. If used material is ingested, seek medical attention and describe material absorbed. EFFECTS OF ACUTE EXPOSURE: Inhalation over long periods of high amounts of any nuisance dust may overload lung clearance mechanism, irritate mucous membranes and make lungs more vulnerable to respiratory disease. MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Pre-existing respiratory problems.
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5. Fire-fighting measures

5.1. Extinguishing media

Recommended extinguishing media; Water fog or spray.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition: High temperatures or fire may produce irritating gases and vapors.

5.3. Advice for fire-fighters

Caution: burning may continue inside bags or piles after surface fire is out. Break bags or separate pile to ensure fire is extinguished. The thermal decomposition products are those commonly observed with natural products such as wood or other vegetative matter.

None

ERG Guide No. ----

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Put on appropriate personal protective equipment (see section 8).

6.2. Environmental precautions

Keep out of surface waters such as lakes, streams and ponds.

Do not allow spills to enter drains or waterways.

Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

6.3. Methods and material for containment and cleaning up

Shovel or scoop back into container for use, if possible, or dispose. Use methods which avoid the creation of airborne dust.

According to EPA 40 CFR 261.3, waste of this product is not defined as hazardous. Dispose of all waste in accordance with applicable federal, state and local regulations.

7. Handling and storage

7.1. Precautions for safe handling

If excessive dust is created, avoid breathing dust by using adequate ventilation and/or using NIOSH- or MSHA-approved respirator for nuisance dust of this type. Breathing dust may be harmful to your health. Protective eyewear should be worn where dust levels are high enough to cause irritation.

7.2. Conditions for safe storage, including any incompatibilities

Handle containers carefully to prevent damage and spillage.

Incompatible materials: No data available.

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7.3. Specific end use(s)

Keep out of reach of children and pets.

8. Exposure controls and personal protection

There are no ingredients in this product which are classified as hazardous, and/or no hazardous ingredients above the GHS cut off percentage.

The exposure limits for nuisance dust are: OSHA PEL: 15 mg/m³ (50 mppcf*) TWA, ACGIH 10 mg/m³.

8.2. Exposure controls

Respiratory	If dust is created, use a NIOSH/SHA-approved respirator for nuisance dust of this type.
Eyes	Protective eyewear should be worn where dust levels are high enough to cause irritation.
Skin	Not normally necessary, but suggested in cases of open wounds that are not appropriately protected.
Engineering Controls	Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits suitable respiratory protection must be worn.
Other Work Practices	Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

See section 2 for further details. - [Prevention]:

9. Physical and chemical properties

Appearance	Dark brown, thick consistency Solid
Odor	None to Earthy
Odor threshold	Not Measured
pH	Not Measured
Melting point / freezing point	Not Measured
Initial boiling point and boiling range	Not Applicable
Flash Point	Not Applicable
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	Lower Explosive Limit: Not Measured Upper Explosive Limit: Not Measured
Vapor pressure (Pa)	Not Measured
Vapor Density	Not Measured
Specific Gravity	Not Applicable

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Solubility in Water	Not Applicable
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	Not Measured

9.2. Other information

No other relevant information.

10. Stability and reactivity

10.1. Reactivity

Hazardous Polymerization will not occur.

10.2. Chemical stability

Stable under normal circumstances.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Keep away from heat, sparks, and open flames.

10.5. Incompatible materials

No data available.

10.6. Hazardous decomposition products

High temperatures or fire may produce irritating gases and vapors.

11. Toxicological information

Acute toxicity

There are no ingredients in this product which are classified as hazardous, and/or no hazardous ingredients above the GHS cut off percentage.

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

Classification	Category	Hazard Description
Acute toxicity (oral)	---	Not Applicable
Acute toxicity (dermal)	---	Not Applicable
Acute toxicity (inhalation)	---	Not Applicable

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Skin corrosion/irritation	---	Not Applicable
Serious eye damage/irritation	---	Not Applicable
Respiratory sensitization	---	Not Applicable
Skin sensitization	---	Not Applicable
Germ cell mutagenicity	---	Not Applicable
Carcinogenicity	---	Not Applicable
Reproductive toxicity	---	Not Applicable
STOT-single exposure	---	Not Applicable
STOT-repeated exposure	---	Not Applicable
Aspiration hazard	---	Not Applicable

12. Ecological information

12.1. Toxicity

No additional information provided for this product. See Section 3 for chemical specific data.

Aquatic Ecotoxicity

There are no ingredients in this product which are classified as hazardous, and/or no hazardous ingredients above the GHS cut off percentage.

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available.

13. Disposal considerations

13.1. Waste treatment methods

Observe all federal, state and local regulations when disposing of this substance.

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14. Transport information

	DOT (Domestic Surface Transportation)	IMO / IMDG (Ocean Transportation)	ICAO/IATA
14.1. UN number	Not Applicable	Not Regulated	Not Regulated
14.2. UN proper shipping name	Not Regulated	Not Regulated	Not Regulated
14.3. Transport hazard class(es)	DOT Hazard Class: Not Applicable	IMDG: Not Applicable Sub Class: Not Applicable	Air Class: Not Applicable
14.4. Packing group	Not Applicable	Not Applicable	Not Applicable
14.5. Environmental hazards			
IMDG	Marine Pollutant: No		
14.6. Special precautions for user	No further information		

15. Regulatory information

Regulatory Overview	The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented.
Toxic Substance Control Act (TSCA)	All components of this material are either listed or exempt from listing on the TSCA Inventory.
WHMIS Classification	Not Regulated
US EPA Tier II Hazards	<div style="text-align: right;">Fire: No</div> <div style="text-align: right;">Sudden Release of Pressure: No</div> <div style="text-align: right;">Reactive: No</div> <div style="text-align: right;">Immediate (Acute): No</div> <div style="text-align: right;">Delayed (Chronic): No</div>

EPCRA 311/312 Chemicals and RQs:

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

EPCRA 302 Extremely Hazardous:

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

EPCRA 313 Toxic Chemicals:

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Carcinogens (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Developmental Toxins (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Female Repro Toxins (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

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Proposition 65 - Male Repro Toxins (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

New Jersey RTK Substances (>1%) :

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Pennsylvania RTK Substances (>1%) :

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

Not Applicable

This is the first version in the GHS SDS format. Listings of changes from previous versions in other formats are not applicable.

These materials are made from natural products and may contain naturally-occurring microorganisms. Proper precautions are advised to prevent infection of open wounds, inhalation of excessive amounts of dust and eye irritation. The proper hygiene practices necessary to prevent health hazards from any naturally-occurring substance such as soil, bark, etc., should be observed.

The information contained in the SDS is provided without warranty of any kind, express or implied. The information contained herein is made available solely for consideration, investigation and verification by the original recipients hereof. Users should consider this information only a supplement to other info gathered by or available to them. Users should make independent determinations of the suitability and completeness of information from all sources to ensure proper use and disposal of these materials for safety and health of employees, customers and the environment. This hazard information is not a substitute for risk assessment under actual conditions of use. Users have the responsibility to keep currently informed on chemical hazard information, to design and update their own programs and to comply with all applicable federal, state and local laws and regulations regarding safety, occupational health, right-to-know and environmental protection.

End of Document

Land Application Plan

It is estimated that HRSD needs a minimum of 2,000 acres of agricultural land per year to sustain full-scale land application operations. The evaluation of potential land application sites is a continual process to ensure that an adequate amount of land is available for the project. The selection process for agricultural farm sites involves the evaluation of the physical, chemical, economic and social characteristics of each prospective site. Prospective farm sites will generally be located in the Virginia Beach, Chesapeake, Suffolk and Isle of Wight County areas. Per agreement with Chesapeake, HRSD will not land apply biosolids within 200 feet of the Northwest River so this is a factor that will be taken into account when evaluating prospective sites. Each prospective site will be inspected by HRSD and HRSD's land application contractor and evaluated for suitability. Sites with the following criteria will be avoided:

- ◇ Areas bordered by ponds, lakes, rivers and streams without appropriate buffer areas
- ◇ Wetlands and marshes
- ◇ Steep areas with sharp relief
- ◇ Undesirable geology (karst, fractured bedrock, rocky, etc.), nonarable land
- ◇ Undesirable soil conditions
- ◇ Environmentally sensitive areas such as floodplains or intermittent streams, ponds or endangered species habitat areas

The evaluation process involves the following steps:

- Initial site screening
 - ⇒ Evaluate regulatory requirements
 - ⇒ Evaluate public acceptance
 - ⇒ Evaluate land area requirement
- Field site survey
 - ⇒ Determine land use (current and future)
 - ⇒ Determine zoning compliance
 - ⇒ Evaluate aesthetics
- Field investigations and soil analysis
 - ⇒ Determine soil characteristics
 - ⇒ Determine hydrology
- Economic feasibility based on site location
 - ⇒ Evaluate transport feasibility
- Final site selection
 - ⇒ Prepare site information package

A site-specific information package will be prepared for each suitable site. Site packages will be submitted to the Department of Environmental Quality for review and approval 90 days prior to commencement of land application operations on the site. HRSD will also send a notification letter to the US Fish and Wildlife Service.

Site information packages will typically contain the following information

- Farm Acreage Summary

A summary listing of the landowner; site number(s) - designated by the Soil Conservation Service, farmer tract number; field number(s); gross acres and net acres available for spreading, and the environmental sensitivity of the soils.

- Soil Information

Information obtained from the Natural Resource Conservation Service – Web Soil Survey: Soil Map with legend and soils information, and a detailed description of each soil series.

- Landowner/Operator Agreements

A signed agreement secured from the farm operator and landowner.

- Maps

A map indicating the site location and its general vicinity, topographic map, field map with acreage prepared by local Farm Service Agency, tax map containing parcel information.

- Field Information

Including tract name, FSA number, location, fields, total acres and usable acres, slope class, hydrologic group, and a summary of soil test results, and field productivities for major crops and yield ranges.

- Soil Test Report

Soil samples will be taken from all fields for laboratory analysis. Each field will be sampled by taking a number of cores and mixing them to form a representative composite sample. The cores will be obtained with a tube-type soil sampler (1 inch diameter) by first scraping away surface litter and then inserting the sampler to plant root depth, 8 inches for row crops, or 4 inches for pasture land. After mixing, the composite sample will be packaged and sent to a qualified laboratory for analysis. Soil samples will be evaluated for cation exchange capacity, pH, and plant nutrients, phosphorus and potassium. Results will be included in each site package.

B.7.d

NUTRIENT MANAGEMENT PLAN IDENTIFICATION

Operator

Don Horsley
3169 Land of Promise Road
Virginia Beach, VA 23457
757-439-5059

F-2019 T-193

F-1406 T-4408 (1-10)

F-1531 T-4410

Total WT: 5,735

Watershed Summary

Watershed: AS10
County: Chesapeake Virginia Beach

Nutrient Management Planner

Christy F. Smith
3160 Jacobia Lane
Cape Charles, VA 23310

Certification Code: 297

Acreage Use Summary

Total Acreage in this plan: 466.4

Cropland: 466.4

Application acreage: 385.78

Hayland: 0.

Pasture: 0.

Specialty: 0.

Livestock Summary

Beef Cattle 0

Dairy Cattle 0

Poultry 0

Swine 0

Other 0

Manure Production Balance

	Imported	Produced	Exported	Used	Net
kgals	0.	0.	0.	0.	0.
tons	0.	0.	0.	0.	0.

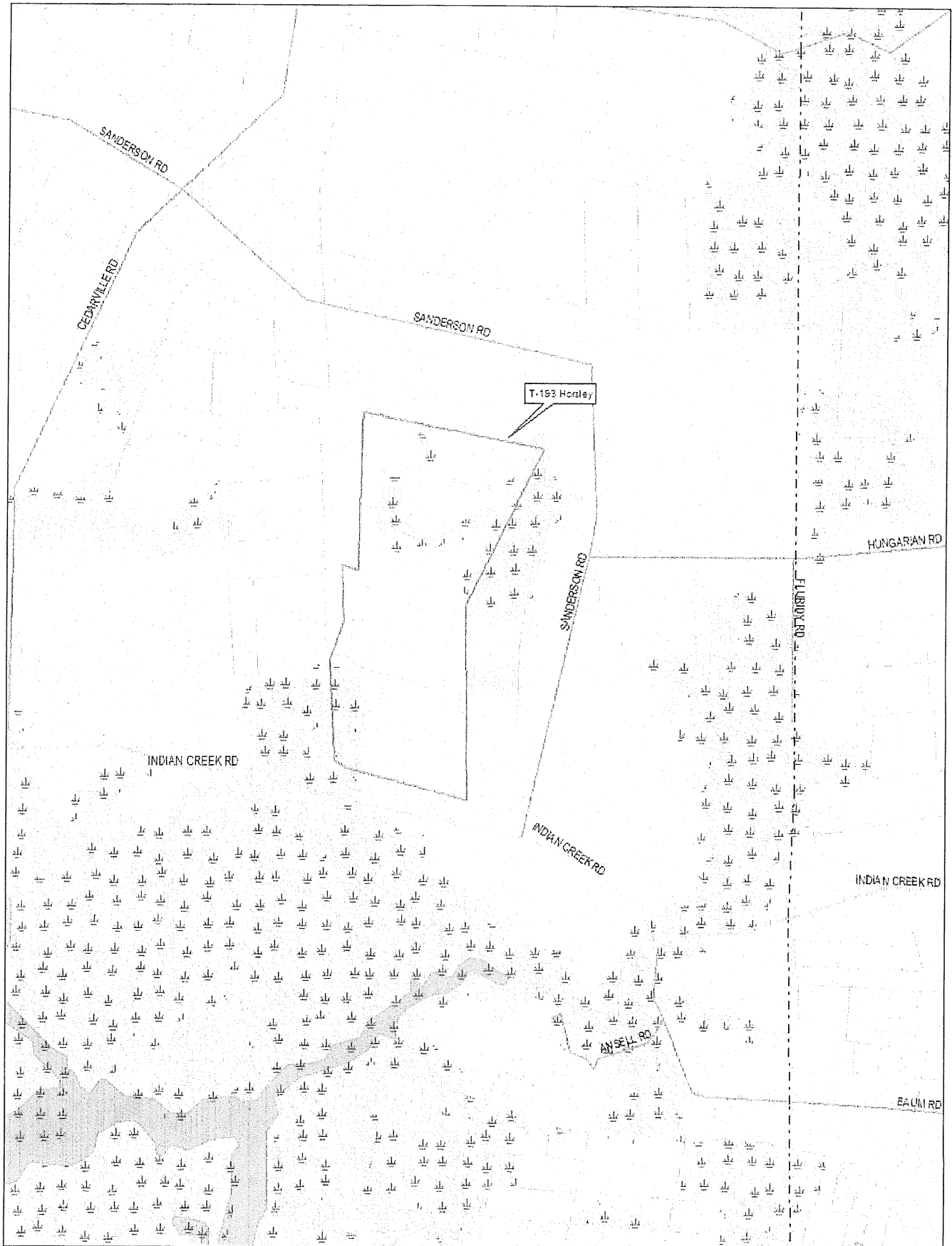
Plan written 12/8/2015

Valid until 12/8/2018

Signature: _____

Christy F. Smith
Planner

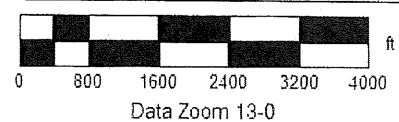
12/8/2015
date

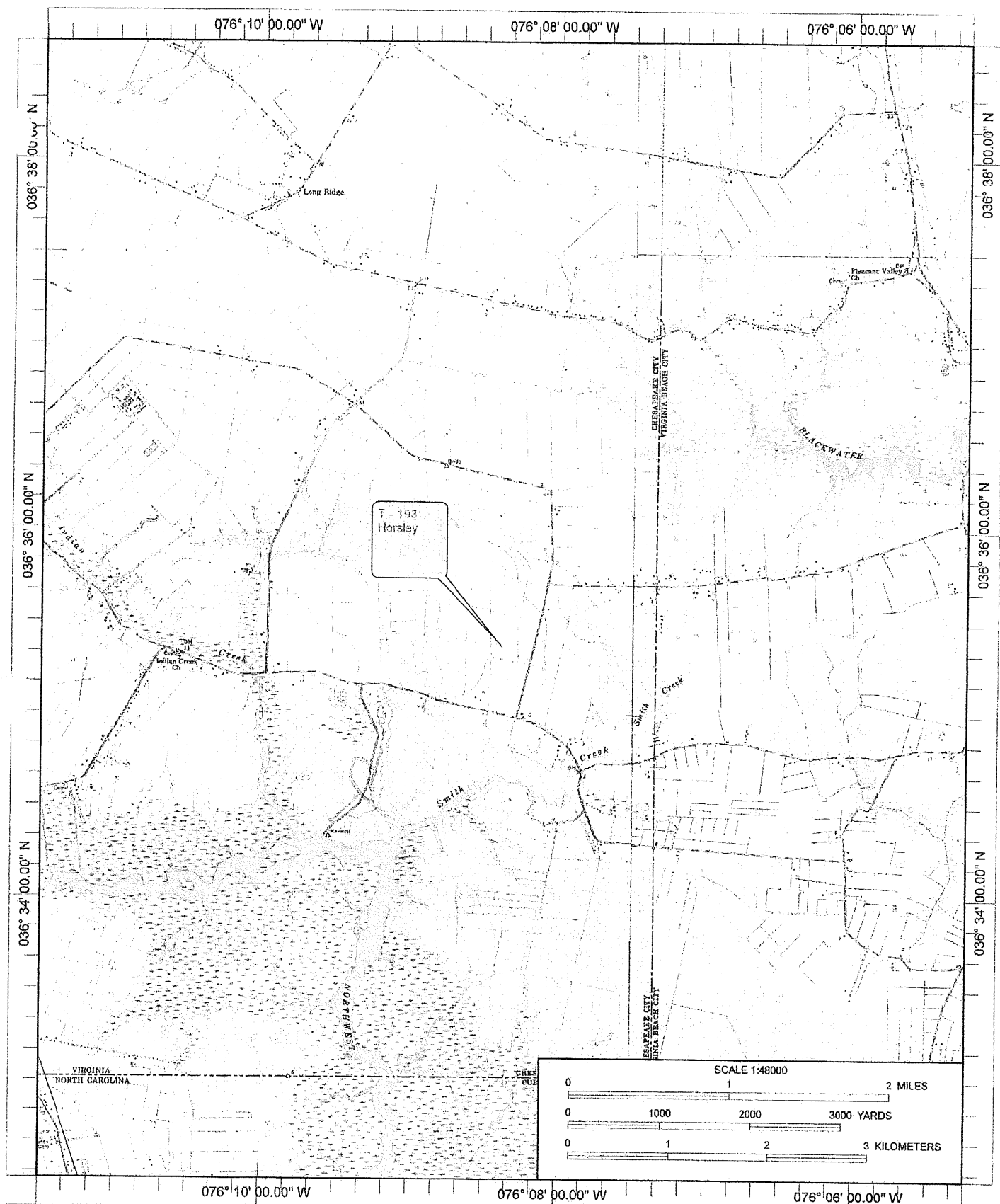


Data use subject to license.

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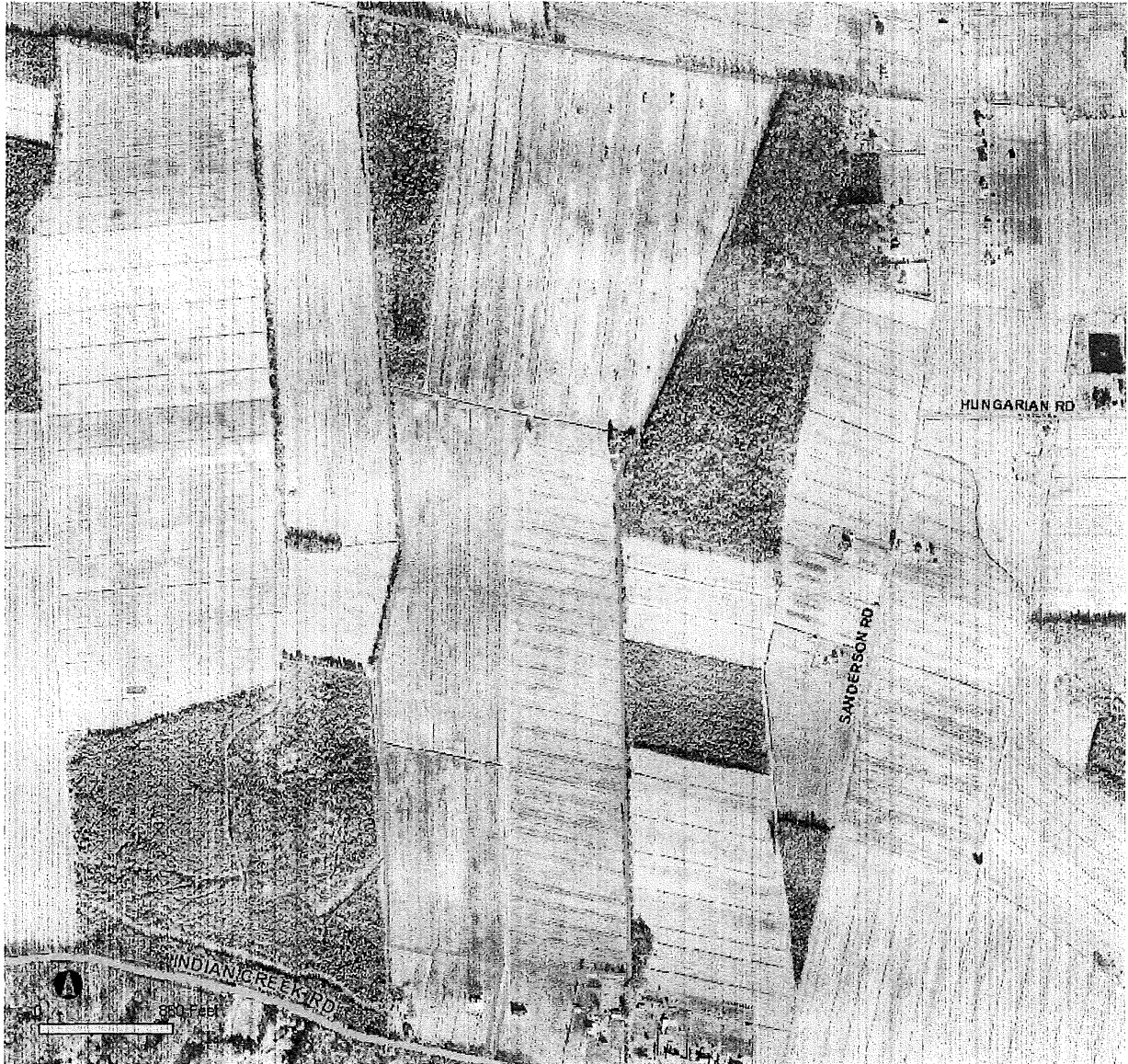
www.delorme.com





Name: MOYOCK
 Date: 11/28/2011
 Scale: 1 inch equals 4000 feet

Location: 036° 35' 33.23" N 076° 08' 22.35" W NAD 27
 Caption: T-193 Horsley



Owner: Rodney Foster

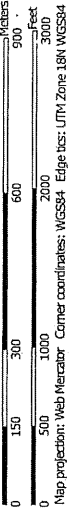
Owner: Donald Horsley
T-193

Tax Map #1100000000140

Soil Map—Chesapeake City, Virginia
(T-193 Horsley)



Map Scale: 1:10,700 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Map Unit Legend

Chesapeake City, Virginia (VA550)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Acredale silt loam, 0 to 1 percent slopes	196.5	92.9%
16	Deloss-Tomolley-Nimmo complex, 0 to 1 percent slopes	11.3	5.4%
23	Gertie silt loam, 0 to 1 percent slopes	3.7	1.7%
Totals for Area of Interest		211.6	100.0%

Nutrient Management Plan Balance Sheet (Fall, 2015-Fall, 2018)

Horsley

Planner: Christy F. Smith (cert. No. 297)

Tract: 193 Location: Chesapeake

(N = N based, 1P = P based, 1.5P = P based at 1.5 removal, 0P = No P allowed)

Field CFA No. /Name	Size (ac) Total/ Used	Yr.	Crop	Needs N-P-K (lbs/ac)	Leg /Man Resid	Manure/Biosld Rate & Type (season)	IT (d)	Man/Bios N-P-K (lbs/ac)	Net = Needs - appld N-P-K (lbs/ac)	Sum P rem cred	Commercial N-P-K (lbs/ac)	Notes
2019/1-24(N)	9	2015	Fallow	0-0-0	0/0				0-0-0	N/A		
		2016	Corn (grain)	170-40-60	20/0	14.4t HRSD 2(Sp)	1	150-378-21	0-(340)-40	N/A	0-0-40(ba)	1
		2017	Wheat (grain)	100-30-40	0/20				80-(310)-40	N/A	25-0-40(br)	2
			-- -- --					0-(280)-40	N/A	55-0-0(td)	3
		2018	Soybeans (DC)	0-30-40	0/0				0-(280)-0	N/A	0-0-40(br)	4
			Fallow	0-0-0	0/0				(20)-(250)-40	N/A		
			Soybeans (FS)	0-30-40	0/20						0-0-40(br)	

Commercial Application Methods:

br - Broadcast ba - Banded sd - Sidedress

Notes:

- 1 Band with planter
- 2 A nitrate soil test is recommended as the basis for modifying N rate. If the nitrate N is the top 6" is above 30 ppm, no fall N is needed. If nitrate N is below 30 ppm, apply 15-30 lbs N.
- 3 Recommend dividing this application between Zadocks growth stage 25 & 30.
- 4 May be broadcast to previous crop. However, on soils with high leaching potential, split applications of K are preferred.

Manure Production Summary

Biosolid Name: HRSD 2016

Availability: unlimited

Biosolid Type: Anaerobic Digestion

% solid: 15.7

pH: 6.2

%CCE: 0.0

Biosolid Analysis (ppm):

TKN: 67607

NH4-N: 23417

NO3: 12

P2O5: 83681.18

K2O: 4664.4

Plant Available Nutrients:

Immediate Incorporation:

10.4 lbs N

26.23 lbs P2O5

1.46 lbs K2O

Surface Applied:

7.83 lbs N

26.23 lbs P2O5

1.46 lbs K2O

Residual N:

yr1: 1.38 lbs N

yr2: 1.38 lbs N

yr3: 0.69 lbs N

Date	CAC03	TS	S	TVS	PH	NH4	Orgn	NO3	P	K	Cd	Cr
2/19/2016	28608.33	15.67	1.85	68.33	8.21	23416.67	49100.00	11.83	36541.67	3886.67	1.74	21.73

Cu	Pb	Ni	Zn	As	Mo	Se	Mn	Mg	Hg	TKN	AN
366.58	17.25	18.17	1589.17	19.33	9.67	5.22	212.67	14505.00	1.45	72500.00	0.00

SAMPLE_S_CACO3	TS	S	TVS	pH	NH4	OrgN	NO3	P	K	Cd	Cr
02/03/201:29800	14.29	1.72	72	8.48	23600	52600	14	28400	3620	2.10	23.80
03/03/201:30400	14.30	1.70	72	8.52	24200	46000	14	27800	3660	2.10	18.20
04/07/201:35500	17.68	2.26	67	8.36	22600	48600	11	33500	2960	2	23.40
05/05/201:29100	15.38	1.89	70	8.10	25400	52800	13	34400	3370	1.60	21.90
06/02/201:29100	16	1.71	67	8.22	20900	52000	13	32400	4020	1.90	21
07/07/201:27700	15.56	1.58	65	8.10	22100	44000	13	43100	4080	1.60	19.20
08/04/201:26200	15.49	1.44	67	8.16	20700	47100	1	39600	4250	1.60	17.30
09/01/201:25700	15.40	1.81	71	8.33	21000	55500	13	34700	4070	1.60	25.10
10/06/201:27500	16.06	2.16	68	8.13	25900	48100	13	43300	4330	1.60	25.20
11/03/201:25900	16.10	1.90	66	8.24	25700	44100	12	37800	4000	1.60	26
12/01/201:28600	16.70	2.13	64	7.62	27300	46200	12	47400	4710	1.50	20
01/05/201:27800	15.06	1.88	71	8.23	21600	52200	13	36100	3570	1.70	19.70

Cu	Pb	Ni	Zn	AS	Mo	Se	Mn	Mg	Hg	TKN
399	18	19	1740	21	12	5	187	9570	1.65	76100
409	18	19	1710	21	9	6	168	8410	1.33	70200
467	22	21	1990	17	12	5	227	13900	1.61	71200
403	18	19	1620	20	10	5.91	192	12300	2	78200
352	19	20	1620	19	7	4.91	236	12000	1.63	72900
323	20	17	1460	19	6	6	249	18000	1.20	66100
335	15	18	1530	19	8	5.11	234	18100	1.01	67800
331	13	16	1370	20	10	5.39	201	9880	1.32	76500
350	16	18	1410	19	12	4.30	212	19800	1.84	73900
342	16	18	1430	19	10	5.05	229	16500	1.24	69800
339	16	17	1540	18	9	5.12	236	22400	1.04	73500
349	16	16	1650	20	11	4.89	181	13200	1.58	73800

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Locations? Contact:

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757-382-6348

Virginia Tech Soil Testing Laboratory

145 Smyth Hall (0465)
185 Ag Quad Ln
Blacksburg, VA 24061
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CAPE CHARLES, VA 23310

SAMPLE HISTORY

Sample ID	Field ID	LAST CROP		LAST LIME APPLICATION		SOIL INFORMATION				
		Name	Yield	Months Prev.	Tons/Acre	SMU-1 %	SMU-2 %	SMU-3 %	Yield Estimate	Productivity Group
1931	HORSLEY									IIB

LAB TEST RESULTS (see Note 1)

Analysis	P (lb/A)	K (lb/A)	Ca (lb/A)	Mg (lb/A)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	Salts (ppm)
Result	133	281	1553	373	1.9	6.4	0.9	55.6	0.3	
Rating	VH	H+	H-	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analysis	Soil pH	Buffer Index	Est.-CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	6.4	6.27	6.5	11.8	88.2	59.2	23.5	5.5	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

Crop: Corn (Grain), Conventional Till (2)

Lime, TONS/AC		Fertilizer, lb/A		
Amount	Type	N	P205	K20
0		140	0	20

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705. ON VERY SANDY SOILS (SANDS, LOAMY SANDS) WHERE THE CLAY LAYER IS MORE THAN 20 INCHES BELOW THE SURFACE, APPLY 30 LBS OF SULFUR PER ACRE. NOTE - ON HEAVIER SOILS (SANDY LOAMS, LOAMS) OR SANDS WHERE THE CLAY LAYER IS LESS THAN 20 INCHES FROM THE SURFACE, NO RESPONSE TO SULFUR IS EXPECTED.

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1931	HORSLEY									I Ib

LAB TEST RESULTS (see Note 1)

Analysis	P (lb/A)	K (lb/A)	Ca (lb/A)	Mg (lb/A)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	S.Salts (ppm)
Result	63	95	2038	431	2.5	5.9	1.3	54.2	0.3	
Rating	H	M-	H+	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analysis	Soil pH	Buffer Index	Est.-CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	5.5	5.76	10.8	35.2	64.8	47.2	16.5	1.1	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

Crop: Corn (Grain), Conventional Till (2)

Lime, TONS/AC		Fertilizer, lb/A		
Amount	Type	N	P205	K20
4.25	AG	140	30	80

635. No further crop response is expected when applying more than 2 to 3 T/A of lime in one application. Therefore, apply half of the total lime now, and the remainder in 6 to 12 months.

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Sample ID	Field ID	LAST CROP		LAST LIME APPLICATION		SOIL INFORMATION				
		Name	Yield	Months Prev.	Tons/Acre	SMU-1 %	SMU-2 %	SMU-3 %	Yield Estimate	Productivity Group
193 2	HORSLEY									I Ib

LAB TEST RESULTS (see Note 1)

Analysis	P (lb/A)	K (lb/A)	Ca (lb/A)	Mg (lb/A)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	S.Salts (ppm)
Result	25	142	1601	394	1.3	6.0	0.8	48.2	0.2	
Rating	M	M	H-	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analysis	Soil pH	Buffer Index	Est.-CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	5.7	5.95	8.5	31.5	68.5	47.2	19.2	2.2	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

FORMS ARE OBSOLETE; USE 2015 FORMS

Crop: Corn (Grain), Conventional Till (2)

Lime, TONS/AC		Fertilizer, lb/A		
Amount	Type	N	P205	K20
3	AG	140	60	60

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		Name	Yield	Months Prev.	Tons/Acre	SMU-1 %	SMU-2 %	SMU-3 %	Yield Estimate	Productivity Group
193 3	HORSLEY									I Ib

LAB TEST RESULTS (see Note 1)

Analysis	P (lb/A)	K (lb/A)	Ca (lb/A)	Mg (lb/A)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	S.Salts (ppm)
Result	192	302	2131	498	3.0	10.1	1.2	54.5	0.4	
Rating	VH	H+	H+	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analysis	Soil pH	Buffer Index	Est.-CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	6.9	6.36	8.0	3.0	97.0	66.5	25.7	4.8	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

Crop: Corn (Grain), Conventional Till (2)

Lime, TONS/AC		Fertilizer, lb/A		
Amount	Type	N	P205	K20
0		140	0	20

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		Name	Yield	Months Prev.	Tons/Acre	SMU-1 %	SMU-2 %	SMU-3 %	Yield Estimate	Productivity Group
193 4	HORSLEY									I Ib

LAB TEST RESULTS (see Note 1)

Analysis	P (lb/A)	K (lb/A)	Ca (lb/A)	Mg (lb/A)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	S.Salts (ppm)
Result	47	206	1893	519	1.4	4.7	0.6	39.9	0.2	
Rating	H-	H-	H	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analysis	Soil pH	Buffer Index	Est.-CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	5.6	5.73	11.1	35.8	64.2	42.6	19.3	2.4	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

Crop: Corn (Grain), Conventional Till (2)

Lime, TONS/AC		Fertilizer, lb/A		
Amount	Type	N	P205	K20
4.25	AG	140	40	40

635. No further crop response is expected when applying more than 2 to 3 T/A of lime in one application. Therefore, apply half of the total lime now, and the remainder in 6 to 12 months.

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Sample ID	Field ID	LAST CROP		LAST LIME APPLICATION		SOIL INFORMATION				
		Name	Yield	Months Prev.	Tons/Acre	SMU-1 %	SMU-2 %	SMU-3 %	Yield Estimate	Productivity Group
1935	HORSLEY									I Ib

LAB TEST RESULTS (see Note 1)

Analysis	P (lb/A)	K (lb/A)	Ca (lb/A)	Mg (lb/A)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	S.Salts (ppm)
Result	68	225	1616	451	2.0	5.6	0.8	51.4	0.2	
Rating	H	H	H-	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analysis	Soil pH	Buffer Index	Est.-CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	5.6	5.94	8.9	30.6	69.4	45.3	20.9	3.2	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

Crop: Corn (Grain), Conventional Till (2)

Lime, TONS/AC		Fertilizer, lb/A		
Amount	Type	N	P205	K20
3	AG	140	30	30

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193 6	HORSLEY									I Ib

LAB TEST RESULTS (see Note 1)

Analysis	P (lb/A)	K (lb/A)	Ca (lb/A)	Mg (lb/A)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	S.Salts (ppm)
Result	50	105	1297	272	2.8	5.9	0.7	47.1	0.2	
Rating	H-	M	M+	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analysis	Soil pH	Buffer Index	Est.-CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	5.1	5.64	9.0	50.1	49.9	36.0	12.5	1.5	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

Crop: Corn (Grain), Conventional Till (2)

Lime, TONS/AC		Fertilizer, lb/A		
Amount	Type	N	P205	K20
5	AG	140	40	60

635. No further crop response is expected when applying more than 2 to 3 T/A of lime in one application. Therefore, apply half of the total lime now, and the remainder in 6 to 12 months.

990. We are trying to improve our service. PLEASE take a moment to complete our brief, anonymous customer survey at tinyurl.com/soiltestsurvey.

991. "Explanation of Soil Tests, Note 1" and other referenced notes are viewable at www.soiltest.vt.edu under Report Notes.

801. The most effective method of application of low rates of phosphate and potash is in a starter (planter) fertilizer placed in a band 2 inches to one side and 2 inches below the seed. Total amount of nitrogen plus potash should not exceed 80 lbs/A.

705. ON VERY SANDY SOILS (SANDS, LOAMY SANDS) WHERE THE CLAY LAYER IS MORE THAN 20 INCHES BELOW THE SURFACE, APPLY 30 LBS OF SULFUR PER ACRE. NOTE - ON HEAVIER SOILS (SANDY LOAMS, LOAMS) OR SANDS WHERE THE CLAY LAYER IS LESS THAN 20 INCHES FROM THE SURFACE, NO RESPONSE TO SULFUR IS EXPECTED.

Virginia Cooperative Extension

Soil Test Report

Questions? Contact:
Chesapeake City Office
Agriculture Dept.
310 Shea Drive
Chesapeake, VA 23322-5597
757-382-6348

Virginia Tech Soil Testing Laboratory
145 Smyth Hall (0465)
185 Ag Quad Ln
Blacksburg, VA 24061
www.soiltest.vt.edu

SEE NOTES:

1 2

at www.soiltest.vt.edu under Report Notes

OWNER

SMITH AG & ENVIRONMENTAL, INC.
3160 JACOBIA LANE

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CAPE CHARLES, VA 23310

SAMPLE HISTORY

Sample ID	Field ID	LAST CROP		LAST LIME APPLICATION		SOIL INFORMATION				
		Name	Yield	Months Prev.	Tons/Acre	SMU-1 %	SMU-2 %	SMU-3 %	Yield Estimate	Productivity Group
1937	HORSLEY									IIB

LAB TEST RESULTS (see Note 1)

Analysis	P (lb/A)	K (lb/A)	Ca (lb/A)	Mg (lb/A)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	S.Salts (ppm)
Result	27	151	2069	589	1.2	4.8	0.6	39.3	0.3	
Rating	M	M+	H+	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analysis	Soil pH	Buffer Index	Est.-CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	6.1	6.12	9.4	17.6	82.4	54.7	25.7	2.1	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

Crop: Corn (Grain), Conventional Till (2)

Lime, TONS/AC		Fertilizer, lb/A		
Amount	Type	N	P205	K20
1.75	AG	140	60	40

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SAMPLE HISTORY

Sample ID	Field ID	LAST CROP		LAST LIME APPLICATION		SOIL INFORMATION				
		Name	Yield	Months Prev.	Tons/Acre	SMU-1 %	SMU-2 %	SMU-3 %	Yield Estimate	Productivity Group
1938	HORSLEY									IIb

LAB TEST RESULTS (see Note 1)

Analysis	P (lb/A)	K (lb/A)	Ca (lb/A)	Mg (lb/A)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	S.Salts (ppm)
Result	122	160	2467	510	3.0	8.2	1.3	63.5	0.3	
Rating	VH	M+	VH	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analysis	Soil pH	Buffer Index	Est.-CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	6.1	6.12	10.1	16.4	83.6	60.8	20.8	2.0	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

Crop: Corn (Grain), Conventional Till (2)

Lime, TONS/AC		Fertilizer, lb/A		
Amount	Type	N	P205	K20
1.75	AG	140	0	40

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CAPE CHARLES, VA 23310

SAMPLE HISTORY

Sample ID	Field ID	LAST CROP		LAST LIME APPLICATION		SOIL INFORMATION				
		Name	Yield	Months Prev.	Tons/Acre	SMU-1 %	SMU-2 %	SMU-3 %	Yield Estimate	Productivity Group
1939	HORSLEY									IIb

LAB TEST RESULTS (see Note 1)

Analysis	P (lb/A)	K (lb/A)	Ca (lb/A)	Mg (lb/A)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	S.Salts (ppm)
Result	48	81	2132	467	2.1	5.1	1.3	55.3	0.3	
Rating	H-	M-	H+	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analysis	Soil pH	Buffer Index	Est.-CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	5.6	5.84	10.7	31.1	68.9	49.9	18.0	1.0	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

Crop: Corn (Grain), Conventional Till (2)

Lime, TONS/AC		Fertilizer, lb/A		
Amount	Type	N	P205	K20
3.75	AG	140	40	80

635. No further crop response is expected when applying more than 2 to 3 T/A of lime in one application. Therefore, apply half of the total lime now, and the remainder in 6 to 12 months.

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9. Incineration. *Alternative Emergency Plan*

(Complete Question 9 if sewage sludge from your facility is fired in a sewage sludge incinerator.)

- a. Total dry metric tons per 365-day period of sewage sludge from your facility fired in a sewage sludge incinerator: 0 dry metric tons 2015 estimate
- b. Do you own or operate all sewage sludge incinerators in which sewage sludge from your facility is fired?
X Yes No
If no, answer questions c - g for each sewage sludge incinerator that you do not own or operate. If you send sewage sludge to more than one sewage sludge incinerator, attach additional pages as necessary.
- c. Incinerator name or number:
- d. Contact person:
Title:
Phone: ()
Contact is: Incinerator Owner Incinerator Operator
- e. Mailing address.
Street or P.O. Box:
City or Town: State: Zip:
- f. Total dry metric tons per 365-day period of sewage sludge from your facility fired in this sewage sludge incinerator: dry metric tons
- g. List on this form or an attachment the numbers of all other federal, state or local permits that regulate the firing of sewage sludge at this incinerator:
Permit Number: Type of Permit:

10. Disposal in a Municipal Solid Waste Landfill. *Alternative Emergency Plan*

(Complete Question 10 if sewage sludge from your facility is placed on a municipal solid waste landfill. Provide the following information for each municipal solid waste landfill on which sewage sludge from your facility is placed. If sewage sludge is placed on more than one municipal solid waste landfill, attach additional pages as necessary.)

- a. Landfill name: Bethel Landfill
- b. Contact person: Howard Burns
Title: Landfill Supervisor
Phone: (757)766-3033
Contact is: X Landfill Owner Landfill Operator
- c. Mailing address.
Street or P.O. Box: 100 North Park Lane
City or Town: Hampton State: VA Zip: 23666
- d. Landfill location.
Street or Route #: 100 North Park Lane
County:
City or Town: Hampton State: VA Zip: 23666
- e. Total dry metric tons per 365-day period of sewage sludge placed in this municipal solid waste landfill:
0 dry metric tons 2015 estimate
- f. List, on this form or an attachment, the numbers of all federal, state or local permits that regulate the operation of this municipal solid waste landfill:
Permit Number: 580 Type of Permit: DEQ- Solid Waste Division
- g. Does sewage sludge meet applicable requirements in the Virginia Solid Waste Management Regulation, 9 VAC 20-80-10 et seq., concerning the quality of materials disposed in a municipal solid waste landfill?
X Yes No
- h. Does the municipal solid waste landfill comply with all applicable criteria set forth in the Virginia Solid Waste Management Regulation, 9 VAC 20-80-10 et seq.? X Yes No
- i. Will the vehicle bed or other container used to transport sewage sludge to the municipal solid waste landfill be watertight and covered? X Yes No
Show the haul route(s) on a location map or briefly describe the route below and indicate the days of the week and time of the day sewage sludge will be transported. Biosolids would be transported via General Booth Boulevard to 264 W. Follow 264 W to 64 W. Stay on 64 W until exit 261. Turn right on Big Bethel Road and turn left on North Park Lane. Transport would occur during daytime business hours of the landfill.

FACILITY NAME: Atlantic STP

VPDES PERMIT NUMBER: VA0081248

SECTION C. LAND APPLICATION OF BULK SEWAGE SLUDGE

Complete this section for sewage sludge that is land applied unless any of the following conditions apply:

The sewage sludge meets the Table 1 ceiling concentrations, the Table 3 pollutant concentrations, Class A pathogen requirements and one of the vector attraction reduction options 1-8 (fill out B.4 instead) (EQ Sludge); or

The sewage sludge is sold or given away in a bag or other container for application to the land (fill out B.5 instead); or

You provide the sewage sludge to another facility for treatment or blending (fill out B.6 instead).

Complete Section C for every site on which the sewage sludge that you reported in B.7 is land applied.

1. Identification of Land Application Site. See attachment for listing of permitted sites.
 - a. Site name or number:
 - b. Site location (Complete i and ii)
 - i. Street or Route#:
County:
City or Town: _____ State: _____ Zip: _____
 - ii. Latitude: _____ Longitude: _____
Method of latitude/longitude determination
_____ USGS map _____ Filed survey _____ Other _____
 - b. Topographic map. Provide a topographic map (or other appropriate map if a topographic map is unavailable) that shows the site location.
2. Owner Information.
 - a. Are you the owner of this land application site? ___ Yes X No
 - b. If no, provide the following information about the owner:
Name: _____
Street or P.O. Box: _____
City or Town: _____ State: _____ Zip: _____
Phone: () _____
3. Applier Information:
 - a. Are you the person who applies, or who is responsible for application of, sewage sludge to this land application site? X Yes ___ No
 - b. If no, provide the following information for the person who applies the sewage sludge:
Name: _____
Street or P.O. Box: _____
City or Town: _____ State: _____ Zip: _____
Phone: () _____
 - c. List, on this form or an attachment, the numbers of all federal, state or local permits that regulate the person who applies sewage sludge to this land application site:
Permit Number: VA0081248 VPDES
VAD980720353 RCRA
60959 DEQ-Air Division
4. Site Type. Identify the type of land application site from among the following:
X Agricultural land _____ Reclamation site _____ Forest
_____ Public contact site _____ Other. Describe _____
5. Vector Attraction Reduction.
Are any vector attraction reduction requirements met when sewage sludge is applied to the land application site?
___ Yes X No If yes, answer a and b.
 - a. Indicate which vector attraction reduction option is met:
___ Option 9 (Injection below land surface)
___ Option 10 (Incorporation into soil within 6 hours)
 - b. Describe, on this form or on another sheet of paper, any treatment processes used at the land application site to reduce the vector attraction properties of sewage sludge:

ATPVPDES_HRSD_PermittedSites

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-101		23.01	Chesapeake	Bunch Walnuts Road near Ballahack Rd	36.594603	-76.28219	1/1/2017
T-104		12.8	Chesapeake	Bunch Walnuts Road near Ballahack Rd	36.597181	-76.280352	1/1/2017
T-1192		100.73	Chesapeake	Corner of Bunch Walnuts Road and Ballahack Rd	36.588636	-76.280881	1/1/2017
T-1212		7.97	Chesapeake	Centerville Turpike near old Centerville Rd	36.674915	-76.192483	1/1/2017
T-1228		85.63	Chesapeake	Douglas Rd. near Rt. 17	36.639318	-76.355637	1/1/2017
T-1265		23.49	Chesapeake	Long Ridge Road and Carolina Road	36.645536	-76.155305	1/1/2017
T-205		280.89	Chesapeake	Centerville Tpke near Land of Promise	36.670264	-76.192269	1/1/2017
T-299		102.73	Chesapeake	Land of Promise Road near Whittamore behind T-608	36.659935	-76.177249	1/1/2017
T-326		244.82	Chesapeake	Centerville Tpke near old Centerville	36.679509	-76.175986	1/1/2017
T-4488		78.34	Virginia Beach	Princess Anne and Vaughan Road	36.67133	-76.026188	1/1/2017
T-608		68.13	Chesapeake	Land of Promise Road near Whittamore	36.667151	-76.171885	1/1/2017
T-702		10.86	Chesapeake	Head of River near Long Ridge Rd.	36.627385	-76.178239	1/1/2017
T-704		21.27	Chesapeake	Head of River near Long Ridge Rd.	36.628284	-76.174483	1/1/2017
T-80		24.58	Chesapeake	2641 Johnstown Road Chesapeake	36.633805	-76.272238	1/1/2017
T-9267		23.73	Chesapeake	Ballahack Rd. near Riverwood Cres.	36.584347	-76.274008	1/1/2017
T-9385		64.15	Chesapeake	Whittamore Road near Land of Promise	36.671403	-76.167531	1/1/2017

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-9484		24.1	Chesapeake	Long Ridge Road near Carolina	36.648078	-76.152189	1/1/2017
T-9790	2014 New Permit	9.17	Chesapeake	Ballahack Road near Bunch Walnuts	36.584896	-76.280407	1/1/2017
T-9804		80.32	Chesapeake	Douglas Road near Rt. 17	36.637683	-76.35882	1/1/2017
T-121		34.5	Chesapeake	Benefit Road (South Side); East of Eason & West of Battlefield	36.631659	-76.21722	1/1/2009
T-1215		164	Chesapeake	800 Head of River N and Beaver Dam S	36.639211	-76.179239	1/1/2009
T-1216		126	Chesapeake	968 Beaver Dam Road (North Side)	36.651659	-76.175832	1/1/2009
T-1220	CP 5	284.7	Chesapeake	800 block Beaver Dam Road (North & South Sides)	36.65277	-76.186387	1/1/2009
T-1228	VB 18	24	Virginia Beach	Fitztown Road Across From Salmons Road	36.597023	-76.014829	1/1/2009
T-123	VB 26	85.2	Virginia Beach	Intersection Oceana Blvd. & First Colonial Road	36.836104	-76.016943	1/1/2009
T-1231		37.7	Chesapeake	2150 Ballahack Road (South Side); Northwest Side of US Navy	36.58027	-76.267776	1/1/2009
T-1238	VB 18	8.5	Virginia Beach	Back Bay Landing Road (North Side); West of T-1256	36.589715	-76.004721	1/1/2009
T-1250	VB 13	32.75	Virginia Beach	Princess Anne Road (West Side); @ Grain Elevator	36.626659	-76.041109	1/1/2009
T-1256	VB 18	69.8	Virginia Beach	Back Bay Landing Road (End)	36.588361	-75.996493	1/1/2009
T-1262	VB 13	39	Virginia Beach	Intersection Princess Anne (Northeast), Mill Landing (North) Roads	36.653048	-76.028054	1/1/2009
T-1264	CP 6	90.3	Chesapeake	1800 block Long Ridge Road (East Side)	36.639159	-76.14972	1/1/2009

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-1267		87.45	Chesapeake	Long Ridge Rd and Land of Promise	36.651186	-76.143094	1/1/2009
T-1268	CP 9	37.8	Chesapeake	2100 block Indian Creek Road (South Side)	36.580826	-76.135832	1/1/2009
T-1286	VB 13	17.8	Virginia Beach	Stowe Road South (North Side) West of "S" Turn	36.648048	-76.039165	1/1/2009
T-1306	VB 18	54.71	Virginia Beach	Princess Anne Road (East Side); North of Mill Landing Road	36.658882	-76.028332	1/1/2009
T-1311		179.8	Chesapeake	Whittamore road (East & West Sides); North of Land of Promise	36.674159	-76.165832	1/1/2009
T-1325		196.9	Chesapeake	2025 Pocatoy Road	36.668371	-76.132903	1/1/2009
T-1327	CP 4	86.1	Chesapeake	Fentress Airfield Road (West Side); Along Runway	36.691659	-76.13222	1/1/2009
T-1334		69.8	Chesapeake	South of Blue Ridge Road @End of Carter Road	36.688048	-76.144998	1/1/2009
T-1339		81.5	Virginia Beach	Charity Neck Road (West Side); South of Gum Bridge Road	36.663058	-76.005818	1/1/2009
T-1359	CP 4	114.3	Chesapeake	Lockhead Avenue (North & South Sides)	36.704159	-76.107498	1/1/2009
T-137	VB 26	114.08	Virginia Beach	London Bridge (East) & Dam Neck (North) Roads	36.788604	-76.046665	1/1/2009
T-1383		78.5	Chesapeake	South Side of Blue Ridge Road, West of T-1334	36.689983	-76.155937	1/1/2009
T-14		24.6	Chesapeake	Relay Road South Side	36.559742	-76.258956	1/1/2009
T-1402		65.4	Virginia Beach	Blackwater & Land of Promise Roads (Southeast Corner)	36.641382	-76.098332	1/1/2009
T-1428	VB 24	63.99	Virginia Beach	West Gibbs Road,	36.55277	-76.088054	1/1/2009

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-1454	CP 6	116.2	Chesapeake	East Side Joins West Side of T-444 1400 block Head of River Road (North Side) @ Cedarville Road	36.627493	-76.150554	1/1/2009
T-1454-VB		80.3	Virginia Beach	Blackwater Road (West Side) North of Land of Promise Road	36.651659	-76.098887	1/1/2009
T-1457	actual acres is 154.17	149.4	Chesapeake	Ballentine Road (North Side); East of RR Tracks	36.626659	-76.191665	1/1/2009
T-1494	CP 14	475.9	Chesapeake	Intersection Shillelagh & Atkinson Roads (Northwest Corner)	36.678048	-76.303609	1/1/2009
T-1516	VB 18	63.4	Virginia Beach	Intersection Princess Anne & Stowe Road South (Southwest Corner)	36.64277	-76.036387	1/1/2009
T-1530		26.97	Virginia Beach	Morris Neck Road (East Side); Opposite Fitztown Road	36.606937	-76.016943	1/1/2009
T-1538	CP 15	34.3	Chesapeake	Relay Road (North Side)	36.573048	-76.251943	1/1/2009
T-1542		72.93	Chesapeake	900 block Whittamore Road (East Side)	36.681382	-76.15972	1/1/2009
T-155	VB 26	45	Virginia Beach	Princess Anne & Phantom Blvd (North side)	36.808882	-76.016109	1/1/2009
T-16	CP 9	21.7	Chesapeake	Hungarian Road (South Side); East of Sanderson Road	36.593882	-76.130554	1/1/2009
T-180	VB 3	77.4	Virginia Beach	3328 North Landing Road (North Side); West of T-78	36.748604	-76.095554	1/1/2009
T-193	CP 9	254.6	Chesapeake	Indian Creek road (North Side); West of sanderson Road	36.591659	-76.143609	1/1/2009

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-198		147.2	Chesapeake	Cedarville Road	36.615726	-76.141631	1/1/2009
T-2	CP 15	58.6	Chesapeake	Relay Road (South Side)	36.564159	-76.248609	1/1/2009
T-200	VB 14	166.8	Virginia Beach	3300 block West Neck (West) & 2413 Indian River (South) Roads	36.718882	-76.048332	1/1/2009
T-2106	VB 13	50.1	Virginia Beach	Mill Landing Road (Adjoining & North of T-1262)	36.654159	-76.024721	1/1/2009
T-213	CP 10	189.5	Chesapeake	1700 block Land of Promise road (South Side)	36.654993	-76.162498	1/1/2009
T-214	CP 15	85.7	Chesapeake	Fentress Airfield Road (North of "S" Turn)	36.697493	-76.11972	1/1/2009
T-2203		115.3	Virginia Beach	Land of Promise (South) & Caroline (North) Roads; West of T-419	36.640522	-76.108411	1/1/2009
T-224		45.9	Chesapeake	Lockhead Ave. North South	36.703893	-76.120577	1/1/2009
T-226		128.2	Chesapeake	Land of Promise Road	36.651451	-76.126049	1/1/2009
T-233		129	Chesapeake	717 Head of River Road (South Side)	36.631104	-76.186943	1/1/2009
T-2400		28.3	Chesapeake	Carolina Road (South Side) @ Bend in Road	36.633264	-76.133868	1/1/2009
T-242	VB 13	97.84	Virginia Beach	Intersection Stowe Road North (North), Princess Anne (West) Roads	36.655826	-76.035276	1/1/2009
T-2489		120.3	Chesapeake	1953 Long Ridge Road (East Side)	36.63527	-76.150832	1/1/2009
T-254	CP 9	55.8	Chesapeake	Intersection Hungarian & Sanderson Roads	36.59527	-76.134165	1/1/2009
T-274	CP 8	234.8	Chesapeake	700 block Head of River (North) & Beaver Dam (South) Roads	36.640826	-76.184998	1/1/2009

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-277	CP 9	55.8	Chesapeake	2100 block Indian Creek road (North Side)	36.583048	-76.130832	1/1/2009
T-294	CP 10	102.7	Chesapeake	Blue Ridge Road (North Side); West Side of Carter Road	36.694993	-76.149165	1/1/2009
T-297-CP	CP 3	80.1	Chesapeake	Silvertown avenue (North); @ End of Road	36.657215	-76.128054	1/1/2009
T-313		47.9	Virginia Beach	Grimstead Road @ End Off of Back Bay Landing Road	36.583777	-75.996911	1/1/2009
T-314-VB	VB 18	280.7	Virginia Beach	Back Bay Landing Road (End) & Fitztown Road @ Salmons Road	36.593048	-76.010554	1/1/2009
T-315	VB 18	42	Virginia Beach	Fitztown Road (North Side) @ West End	36.594437	-76.030276	1/1/2009
T-327	VB 18	88.9	Virginia Beach	Intersection Morris Neck & Mill Landing Roads	36.640826	-76.014165	1/1/2009
T-328		77.8	Virginia Beach	Intersection Princess Anne & Old & New Pungo Ferry Roads	36.619159	-76.039165	1/1/2009
T-332-CP	CP 11	186.04	Chesapeake	Fentress Airfield Road (West Side); @ Intersection Long Ridge	36.672215	-76.151665	1/1/2009
T-332-VB		145.7	Virginia Beach	Fitztown Road (South Side) @ West End	36.590826	-76.031109	1/1/2009
T-339	VB 13	40.5	Virginia Beach	894 Princess Anne Road (West Side); North of Creeds School	36.639993	-76.041109	1/1/2009
T-343		16.5	Virginia Beach	Morris Neck Road (West Side); Opposite Campbells Road	36.61027	-76.013887	1/1/2009
T-344		31.3	Chesapeake	Mt Pleasant Rd near Wenger Rd	36.715831	-76.148191	1/1/2009
T-3479		91.58	Chesapeake	Head of River Road	36.634324	-76.176642	1/1/2009

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-366		51.8	Chesapeake	before Long Ridge Road 2500 block Number Ten Lane (South Side)	36.69527	-76.342776	1/1/2009
T-370	VB 18	16.7	Virginia Beach	Pocahontas Club Road (East Side)	36.56277	-75.997498	1/1/2009
T-4026	VB 22	210.6	Virginia Beach	Firefall Drive (South); At End	36.766208	-75.978278	1/1/2009
T-405		348.55	Chesapeake	Cedarville Rd and Sanderson Rd.	36.610231	-76.139285	1/1/2009
T-4063	VB 26	62.5	Virginia Beach	London Bridge Road (East Side) Along RR Tracks, South of T-68	36.80277	-76.056665	1/1/2009
T-4064	VB 26	19.7	Virginia Beach	Swamp Road (West Side)	36.796382	-76.055276	1/1/2009
T-4065	VB 26	14	Virginia Beach	Harpers Road (North) & Oceana Blvd (West)	36.800548	-76.006665	1/1/2009
T-4066	VB 26	41.7	Virginia Beach	500 block London Bridge Road (East Side)	36.821104	-76.049443	1/1/2009
T-4067		115	Virginia Beach	West End of Ives Road off of Blackwater Road	36.659715	-76.112776	1/1/2009
T-4099		64.4	Chesapeake	Long Ridge Road near Carolina Rd	36.64603	-76.14189	1/1/2009
T-41	VB 26	58.4	Virginia Beach	Intersection Potters (North) & Sludge Roads	36.837493	-76.045554	1/1/2009
T-419		290.66	Virginia Beach	Land of Promise Road (North & South Sides)	36.646625	-76.104438	1/1/2009
T-42	VB 26	185.9	Virginia Beach	500 block Oceana Blvd & First Colonial Road	36.818604	-76.010554	1/1/2009
T-42-CP		42.6	Chesapeake	300 Ballhack Road (South Side); East of T-33	36.556328	-76.208342	1/1/2009
T-423	VB 8	135.5	Virginia Beach	6273 Blackwater	36.572215	-76.079443	1/1/2009

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-424	CP 13	179.6	Chesapeake	(West) & West Gibbs (North & South) Roads	36.581659	-76.186109	1/1/2009
T-425	VB 9	107.3	Virginia Beach	Gallbush Road (East & West Sides); South of Indian Creek	36.597493	-76.084165	1/1/2009
T-433	VB 29	70.03	Virginia Beach	5720 Blackwater Road (East Side) Opposite Hungarian Road	36.656382	-76.096109	1/1/2009
T-4341		14.14	Virginia Beach	4490 Blackwater Road (East Side)	36.679665	-76.044666	1/1/2009
T-4344	T-9329	26.22	Virginia Beach	2180 Vaughan Road	36.557452	-76.075027	1/1/2009
T-4345	VB 28; T-9328	194.5	Virginia Beach	Blackwater Road	36.574159	-76.073054	1/1/2009
T-438	T-472 Field 7	40.59	Chesapeake	6152 Blackwater Road (East Side) Opposite West Gibbs Road	36.580519	-76.180193	1/1/2009
T-4380		33.96	Virginia Beach	Gallbush Road (East Side)	36.673955	-76.041981	1/1/2009
T-4408-CP	T-571-CP	54	Chesapeake	2180 Vaughan Road	36.577493	-76.125554	1/1/2009
T-4408-VB	T-571	52	Virginia Beach	2324 Indian Creek Road & Baum Road	36.58277	-76.119443	1/1/2009
T-4409	T-1435;VB 25	53.56	Virginia Beach	2324 Indian Creek Road (North Side)	36.583183	-76.108515	1/1/2009
T-4410	T-571-VB	228	Virginia Beach	2324 Indian Creek Road (North Side)	36.578882	-76.114998	1/1/2009
T-4411	T-1435;VB 25	149.25	Virginia Beach	2324 Indian Creek Road (South Side)	36.585548	-76.104165	1/1/2009
T-444	VB 24	105.39	Virginia Beach	2324 Indian Creek Road (North Side)	36.553326	-76.078887	1/1/2009
T-4448		56.02	Virginia Beach	6621 Blackwater Road (West Side)	36.75745	-76.087923	1/1/2009
T-4467		16.9	Virginia Beach	Landstown Road and Two Farms Lane	36.681857	-76.046463	1/1/2009
T-450		20.34	Chesapeake	2337 Vaughan Road	36.629055	-76.177288	1/1/2009
T-456		92.1	Virginia Beach	Head of River near Long Ridge Road Land of Promise	36.641937	-76.11722	1/1/2009

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-459		126.8	Virginia Beach	Road (South); West of T-2203	36.638284	-76.124025	1/1/2009
T-4590	T-4407;T-9209;VB 25; T-4521	184.26	Virginia Beach	Land of Promise Road (South); West of T-456, City line splits 2300 block Indian Creek Road (North & South Sides)	36.586659	-76.11472	1/1/2009
T-460		175.2	Virginia Beach	4780 Blackwater Road (East Side) Opposite Carolina Road	36.641104	-76.087498	1/1/2009
T-4608	T-427	104.8	Virginia Beach	Princess Anne Road (East Side); South of Creeds School	36.634993	-76.032776	1/1/2009
T-4609	T-427	107.21	Chesapeake	Princess Anne Road (East Side); South of Creeds School	36.639031	-76.030601	1/1/2009
T-461	CP12	126.6	Chesapeake	Intersection Long Ridge (North) & Peoples (North) Roads	36.628326	-76.155832	1/1/2009
T-464		411.94	Chesapeake	3400 block Cedarville (East) & 1516 Indian Creek (North) Roads	36.591659	-76.158332	1/1/2009
T-465		130.14	Chesapeake	Land of Promise Road at Chesapeake Boundary	36.648608	-76.119129	1/1/2009
T-47	VB 26	27.8	Virginia Beach	500 block Oceana Blvd (East Side)	36.81527	-76.005276	1/1/2009
T-472	CP 6	55.76	Chesapeake	Gallbush Road (East Side)	36.582215	-76.177498	1/1/2009
T-485		35.7	Chesapeake	Gallbush Road and Indian Creek	36.589255	-76.18327	1/1/2009
T-491		97.7	Chesapeake	2236 Carolina Road (North Side)	36.644159	-76.151665	1/1/2009
T-523		43.2	Chesapeake	Head of River near Dapple Grey Ct	36.624756	-76.139519	1/1/2009
T-5241		133.4	Chesapeake	Ballentine Road (Northeast Corner); @ End of Road	36.623604	-76.183609	1/1/2009

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-535	CP 9	23.6	Chesapeake	2100 block Indian Creek Road (South Side); East of T-1268	36.582493	-76.140554	1/1/2009
T-542		96.7	Chesapeake	Cedarville Road (West Side); South of Sanderson Road	36.60777	-76.165554	1/1/2009
T-544	CP 15	227.6	Chesapeake	Relay Road (North Side)	36.563326	-76.264165	1/1/2009
T-566	CP 15	100.8	Chesapeake	Carolina Road (South Side); West of T-9374	36.629993	-76.134998	1/1/2009
T-577		30	Chesapeake	Battlefield Blvd (East Side); South of Intersection	36.558758	-76.195699	1/1/2009
T-579		132.6	Chesapeake	Ballahack Road	36.663604	-76.185554	1/1/2009
T-621		23.2	Chesapeake	1755 Centerville Turnpike (East Side)	36.70277	-76.148887	1/1/2009
T-625		249	Chesapeake	Bedford Street (South Side); East of T-9477 & West of T-644	36.699159	-76.164165	1/1/2009
T-650	CP 13	80.6	Chesapeake	Bedford Street (East & West Sides); North of Blue Ridge Road	36.631826	-76.140443	1/1/2009
T-656		125	Chesapeake	Carolina Road (North & South Side); West of T-566	36.698604	-76.144165	1/1/2009
T-669		24.2	Chesapeake	Carter Road (West Side); Just North of Blue Ridge Road	36.699437	-76.093887	1/1/2009
T-68	VB 26	78.1	Virginia Beach	Blackwater Road (Northeast Side); Just East of Fentress Airfield Rd	36.811104	-76.04972	1/1/2009
T-687	CP 6	121.51	Chesapeake	800 block London Bridge Road (East Side); Along RR Tracks	36.644715	-76.162498	1/1/2009
T-693		211.07	Chesapeake	1800 block Long Ridge Road (West Side)	36.688882	-76.102498	1/1/2009
				Blackwater Road (East & West Side);			

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-707	CP 10	123.8	Chesapeake	South of T-669 1600 block Land of Promise road (South Side)	36.66027	-76.167776	1/1/2009
T-718	CP 15	117.9	Chesapeake	Carter Road (East Side); Near Runway	36.70027	-76.138054	1/1/2009
T-78	VB 3	311.2	Virginia Beach	3328 North Landing Road (North Side); West of T-78	36.744784	-76.08659	1/1/2009
T-8	CP15	74	Chesapeake	Relay Road (South Side)	36.557215	-76.246109	1/1/2009
T-833	VB 14	43.3	Virginia Beach	3200 block West Neck Road (West Side)	36.718326	-76.054165	1/1/2009
T-869	VB 14	142.3	Virginia Beach	3500 block West Neck Road (West Side)	36.70527	-76.053332	1/1/2009
T-9-CP	CP 9	87.6	Chesapeake	Ansell Road @ End Just Off Baum Road	36.573048	-76.13722	1/1/2009
T-9-VB		75.44	Virginia Beach	3169 Land of Promise Road	36.643088	-76.112661	1/1/2009
T-9234		30.7	Chesapeake	1700 block Head of River Road (South Side)	36.61598	-76.127465	1/1/2009
T-9236		89.6	Chesapeake	1500 block Head of River Rd	36.618155	-76.139229	1/1/2009
T-9255		33.65	Chesapeake	1000 block Head of River Road (South Side); @ Long Ridge Road	36.626937	-76.17472	1/1/2009
T-931	CP15	63.7	Chesapeake	2000 block Long Ridge Road (East Side)	36.633604	-76.156943	1/1/2009
T-934		23.3	Chesapeake	Ballahack Rd. near Neck Rd.	36.558574	-76.187753	1/1/2009
T-935		8.06	Chesapeake	Ballahack Road	36.559674	-76.209009	1/1/2009
T-9373	CP 7	106.36	Chesapeake	Intersection Head of River (South) & Cedarville (West) Roads	36.620826	-76.155554	1/1/2009
T-9374	CP 15	157.1	Chesapeake	Carolina Road (South Side); West of VB	36.631382	-76.125832	1/1/2009

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-9376		67.82	Chesapeake	City Line	36.629846	-76.12125	1/1/2009
T-9402		22.6	Chesapeake	Old Carolina Road	36.550548	-76.241109	1/1/2009
				Backwoods Road			
				(North Side); West of			
				T-9401, North of NC			
				Line			
T-9434		140.51	Chesapeake	Between 1200	36.682493	-76.174998	1/1/2009
				Centerville Tpk &			
				Whittamore Road,			
				South of Murry			
T-9451		13.9	Chesapeake	Carolina Road	36.635639	-76.142054	1/1/2009
T-9452		53.3	Chesapeake	Carolina Road	36.632799	-76.142844	1/1/2009
T-9477		26.3	Chesapeake	Bedford Street (South	36.70277	-76.151109	1/1/2009
				Side); West of T-621			
T-9491		34.76	Chesapeake	Ballahack Road	36.559949	-76.220518	1/1/2009
T-9532	T-1251 Weatherly	95.8	Chesapeake	Ballentine Road	36.620826	-76.191665	1/1/2009
				(South Side) @ End,			
				East of RR Tracks			
T-9594		110.2	Chesapeake	Bedford Street	36.699107	-76.156571	1/1/2009
				(Southside)			
T-9602		283.9	Chesapeake	Fentress Airfield	36.65409	-76.15799	1/1/2009
				Road (West side) @			
				intersection Land of			
				Promise			
T-9604		78.2	Chesapeake	Off of Beaver Dam	36.641555	-76.163096	1/1/2009
				Road			
T-9620		109.41	Chesapeake	Head of River Road	36.626843	-76.144323	1/1/2009
T-9621		1.2	Chesapeake	Head of River Rd.	36.622072	-76.14497	1/1/2009
				near Dapple Grey Ct.			
T-9630		22.11	Chesapeake	Ballahack Road	36.586831	-76.276418	1/1/2009
T-9631		5.79	Chesapeake	Ballahack Rd. near	36.58722	-76.27779	1/1/2009
				Carolina Rd			
T-9634		44.5	Chesapeake	Off of Sanderson	36.603183	-76.127631	1/1/2009
				Road			
T-9680	T-9401	45.7	Chesapeake	Backwoods Road	36.551937	-76.23722	1/1/2009
				(North Side); North			
				of NC Line			
T-9688	T-221	32.32	Chesapeake	Sanderson Road	36.616068	-76.168489	1/1/2009

TRACT_NUMB	OLD_ID	ACRES	CITY	LOCATION	LAT_DD	LONG_DD	BEGIN_DATE
T-9689	T-221	94.66	Chesapeake	Head of River between Long Ridge Rd and Peoples Rd	36.623311	-76.166563	1/1/2009
T-9736	T-9437	64.5	Chesapeake	1500 block Long Ridge (West) & 1800 block Land of Primise (South)	36.648947	-76.15871	1/1/2009
T-9814	T-18	70.21	Chesapeake	Relay Road SS	36.556234	-76.269057	1/1/2009
Sum ACRES	17256.96						

FACILITY NAME: Atlantic STP

VPDES PERMIT NUMBER: VA0081248

6. Cumulative Loadings and Remaining Allotments. *Not applicable*
(Complete Question 6 only if the sewage sludge applied to this site since July 20, 1993 is subject to the cumulative pollutant loading rates (CPLRs) - see instructions.)
- a. Have you contacted DEQ or the permitting authority in the state where the sewage sludge subject to the CPLRs will be applied to ascertain whether bulk sewage sludge subject to the CPLRs has been applied to this site since July 20, 1993? Yes No
If no, sewage sludge subject to the CPLRs may not be applied to this site.
If yes, provide the following information:
Permitting authority:
Contact person:
Phone: ()
- b. Based upon this inquiry, has bulk sewage sludge subject to the CPLRs been applied to this site since July 20, 1993? Yes No If no, skip the rest of Question 6. If yes, answer questions c - e.
- c. Site size, in hectares: _____ (one hectare = 2.471 acres)
- d. Provide the following information for every facility other than yours that is sending or has sent sewage sludge subject to the CPLRs to this site since July 20, 1993. If more than one such facility sends sewage sludge to this site, attach additional pages as necessary.
Facility name:
Facility contact:
Title:
Phone: ()
Mailing address:
Street or P.O. Box:
City or Town: _____ State: _____ Zip: _____
- e. Provide the total loading and allotment remaining, in kg/hectare, for each of the following pollutants:
- | | <u>Cumulative loading</u> | <u>Allotment remaining</u> |
|----------|---------------------------|----------------------------|
| Arsenic | _____ | _____ |
| Cadmium | _____ | _____ |
| Copper | _____ | _____ |
| Lead | _____ | _____ |
| Mercury | _____ | _____ |
| Nickel | _____ | _____ |
| Selenium | _____ | _____ |
| Zinc | _____ | _____ |

Complete Questions 7-12 below only if you apply sewage sludge, or you are responsible for land application of sewage sludge. Information required by these questions may be prepared as attachments to this form. Skip the following questions if you contract land application to someone else (as indicated under Section A.7) who is responsible for the operation.

7. Sludge Characterization. Use the table below or a separate attachment, provide at least one analysis for each parameter. **See attached sheet**
- PCBs (mg/kg)
pH (S. U.)
Percent Solids (%)
Ammonium Nitrogen (mg/kg)
Nitrate Nitrogen (mg/kg)
Total Kjeldahl Nitrogen (mg/kg)
Total Phosphorus (mg/kg)
Total Potassium (mg/kg)
Alkalinity as CaCO₃* (mg/kg)

* Lime treated sludge (10% or more lime by dry weight) should be analyzed for percent CaCO₃.



CENTRAL ENVIRONMENTAL
LABORATORY
ANALYTICAL REPORT
VA Laboratory ID 460011

HRSD

Job ID: AT-3-MAR-15-2

Report Serial No.: 2015-959

Sample ID: AT_NSP-C-030315-1

Sample Date: 3/3/2015

Customer Sample ID: 503 & TCLP Sample

Sample ID: 361505

Sample Sub-Type:

Analyte	Method	CAS#	Unit	Result	Flag	LOQ	Analyst	Analysis Date	Analysis Time
Free Liquid	EPA 9095B			Negative		NA	AMOORE	03/04/15	14:34
Chlordane	EPA 8081B	00057-74-9	mg/l	ND		0.0002	MBOGGIO	03/17/15	00:46
Endrin	EPA 8081B	00072-20-8	mg/l	<0.0005		0.0005	MBOGGIO	03/16/15	19:03
Heptachlor	EPA 8081B	00076-44-8	mg/l	<0.0005		0.0005	MBOGGIO	03/16/15	19:03
Heptachlor Epoxide	EPA 8081B	01024-57-3	mg/l	<0.0005		0.0005	MBOGGIO	03/16/15	19:03
Lindane	EPA 8081B	00058-89-9	mg/l	<0.0005		0.0005	MBOGGIO	03/16/15	19:03
Methoxychlor	EPA 8081B	00072-43-5	mg/l	<0.0005		0.0005	MBOGGIO	03/16/15	19:03
Toxaphene	EPA 8081B	08001-35-2	mg/l	ND		0.0005	MBOGGIO	03/17/15	00:46
AR1016	EPA 8082A	12674-11-2	mg/l	<0.001		0.001	MBOGGIO	03/17/15	00:46
AR1221	EPA 8082A	11104-28-2	mg/l	<0.001		0.001	MBOGGIO	03/17/15	00:46
AR1232	EPA 8082A	11141-16-5	mg/l	<0.001		0.001	MBOGGIO	03/17/15	00:46
AR1242	EPA 8082A	53469-21-9	mg/l	<0.001		0.001	MBOGGIO	03/17/15	00:46
AR1248	EPA 8082A	12672-29-6	mg/l	<0.001		0.001	MBOGGIO	03/17/15	00:46
AR1254	EPA 8082A	11097-69-1	mg/l	<0.001		0.001	MBOGGIO	03/17/15	00:46

Notes

LOQ is lowest concentration at which quantitation is demonstrated.

*Analyte is not included in the HRSD CEL VELAP scope of accreditation



CENTRAL ENVIRONMENTAL
LABORATORY
ANALYTICAL REPORT
VA Laboratory ID 460011

HRSD

Job ID: AT-3-MAR-15-2

Report Serial No.: 2015-959

Sample ID: AT_NSP-C-030315-1

Sample Date: 3/3/2015

Customer Sample ID: 503 & TCLP Sample

Sample ID: 361505

Sample Sub-Type:

Analyte	Method	CAS#	Unit	Result	Flag	LOQ	Analyst	Analysis Date	Analysis Time
AR1260	EPA 8082A	11096-82-5	mg/l	<0.001		0.001	MBOGGIO	03/17/15	00:46
Mercury, Total	EPA 7470A	92786-62-4	mg/l	<0.0001		0.0001	BSTAPLES	03/27/15	08:30
Arsenic, Total	EPA 6010C	7440-38-2	mg/l	<0.030		0.030	BSTAPLES	03/25/15	11:54
Barium, Total	EPA 6010C	7440-39-3	mg/l	0.041		0.005	BSTAPLES	03/31/15	08:52
Cadmium, Total	EPA 6010C	7440-43-9	mg/l	<0.005		0.005	BSTAPLES	03/25/15	11:54
Chromium, Total	EPA 6010C	7440-47-3	mg/l	<0.005		0.005	BSTAPLES	03/25/15	11:54
Lead, Total	EPA 6010C	7439-92-1	mg/l	<0.015		0.015	BSTAPLES	03/25/15	11:54
Selenium, Total	EPA 6010C	7782-49-2	mg/l	<0.050		0.050	BSTAPLES	03/25/15	11:54
Silver, Total	EPA 6010C	7440-22-4	mg/l	<0.005		0.005	BSTAPLES	03/25/15	11:54
Corrosivity	EPA 9045D		su	8.52		NA	AMOORE	03/04/15	14:07
2,4,5-Trichlorophenol	EPA 8270D	95-95-4	mg/l	<0.010		0.010	IGERASIMOV	03/13/15	02:22
2,4,6-Trichlorophenol	EPA 8270D	88-06-2	mg/l	<0.010		0.010	IGERASIMOV	03/13/15	02:22
2,4-Dinitrotoluene	EPA 8270D	121-14-2	mg/l	<0.010		0.010	IGERASIMOV	03/13/15	02:22
Hexachlorobenzene	EPA 8270D	118-74-1	mg/l	<0.010		0.010	IGERASIMOV	03/13/15	02:22

Notes

LOQ is lowest concentration at which quantitation is demonstrated.

*Analyte is not included in the HRSD CEL VELAP scope of accreditation



CENTRAL ENVIRONMENTAL
LABORATORY
ANALYTICAL REPORT
VA Laboratory ID 460011



Job ID: AT-3-MAR-15-2

Report Serial No.: 2015-959

Sample ID: AT_NSP-C-030315-1

Sample Date: 3/3/2015

Customer Sample ID: 503 & TCLP Sample

Sample ID: 361505

Sample Sub-Type:

Analyte	Method	CAS#	Unit	Result	Flag	LOQ	Analyst	Analysis Date	Analysis Time
Hexachlorobutadiene	EPA 8270D	87-68-3	mg/l	<0.010		0.010	IGERASIMOV	03/13/15	02:22
Hexachloroethane	EPA 8270D	67-72-1	mg/l	<0.010		0.010	IGERASIMOV	03/13/15	02:22
m/p-Cresol	EPA 8270D	106-44-5	mg/l	<0.010		0.010	IGERASIMOV	03/13/15	02:22
Nitrobenzene	EPA 8270D	98-95-3	mg/l	<0.010		0.010	IGERASIMOV	03/13/15	02:22
o-Cresol	EPA 8270D	95-48-7	mg/l	<0.010		0.010	IGERASIMOV	03/13/15	02:22
Pentachlorophenol	EPA 8270D	87-86-5	mg/l	<0.010		0.010	IGERASIMOV	03/15/15	03:29
Pyridine	EPA 8270D	110-86-1	mg/l	<0.010		0.010	IGERASIMOV	03/13/15	02:22
Total Cresol	EPA 8270D		mg/l	<0.020		0.020	IGERASIMOV	03/13/15	02:22

Notes

LOQ is lowest concentration at which quantitation is demonstrated.
*Analyte is not included in the HRSD CEL VELAP scope of accreditation



CENTRAL ENVIRONMENTAL
LABORATORY
ANALYTICAL REPORT
VA Laboratory ID 460011

HRSD

Job ID: AT-3-MAR-15-2

Report Serial No.: 2015-959

Sample ID: AT_NSP-G-030315-1

Sample Date: 3/3/2015

Customer Sample ID: TCLP Sample

Sample ID: 361506

Sample Sub-Type:

Analyte	Method	CAS#	Unit	Result	Flag	LOQ	Analyst	Analysis Date	Analysis Time
1,1-Dichloroethene	EPA 8260C	75-35-4	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00
1,2-Dichloroethane	EPA 8260C	107-06-2	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00
1,4-Dichlorobenzene	EPA 8260C	106-46-7	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00
2-Butanone	EPA 8260C	78-93-3	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00
Benzene	EPA 8260C	71-43-2	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00
Carbon Tetrachloride	EPA 8260C	56-23-5	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00
Chlorobenzene	EPA 8260C	108-90-7	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00
Chloroform	EPA 8260C	67-66-3	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00
Tetrachloroethene	EPA 8260C	127-18-4	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00
Trichloroethene	EPA 8260C	79-01-6	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00
Vinyl Chloride	EPA 8260C	75-01-4	mg/l	<0.010		0.010	SLOPEZ	03/16/15	19:00

Notes

LOQ is lowest concentration at which quantitation is demonstrated.

*Analyte is not included in the HRSD CEL VELAP scope of accreditation

Authorized By: Li Zhang - Lab Manager

Date Authorized: 6/11/2015

C.7

Atlantic STP Biosolids Data VA0081248

Parameter	pH	TS	TKN	NH3	NOX	P	K
Unit	SU	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1/7/15	8.3	15.7	75100	23000	<13	25100	2910
2/3/15	8.5	14.3	76100	23600	<14	28400	3620
3/3/15	8.5	14.3	70200	24200	<14	27800	3660
4/7/15	8.4	17.7	71200	22600	<11	33500	2960
5/5/15	8.1	15.4	78200	25400	<13	34400	3370
6/2/15	8.2	16.0	72900	20900	<12	32400	4020
7/7/15	8.1	15.6	66100	22100	<13	43100	4080
8/4/15	8.2	15.5	67800	20700	32.2	39600	4250
9/1/15	8.3	15.4	76500	21000	<13	34700	4070
10/6/15	8.1	16.1	73900	25900	<12	43300	4330
11/3/15	8.2	16.1	69800	25700	<12	37800	4000
12/1/15	7.6	16.7	73500	27300	31	1080	4710

8. Storage Requirements. **See attachment**

Existing and proposed sludge storage facilities must provide an estimated annual sludge balance on a monthly basis incorporating such factors as storage capacity, sludge production and land application schedule. Include pertinent calculations justifying storage requirements.

Proposed sludge storage facilities must also provide the following information:

- a. A sludge storage site layout on a 7.5 minute topographic quadrangle or other appropriate scaled map to show the following topographic features of the surrounding landscape to a distance of 0.25 mile. Clearly mark the property line.

- 1) Water wells, abandoned or operating
- 2) Surface waters
- 3) Springs
- 4) Public water supply(s)
- 5) Sinkholes
- 6) Underground and/or surface mines
- 7) Mine pool (or other) surface water discharge points
- 8) Mining spoil piles and mine dumps
- 9) Quarry(s)
- 10) Sand and gravel pits
- 11) Gas and oil wells
- 12) Diversion ditch(s)
- 13) Agricultural drainage ditch(s)
- 14) Occupied dwellings, including industrial and commercial establishments
- 15) Landfills or dumps
- 16) Other unlined impoundments
- 17) Septic tanks and drainfields
- 18) Injection wells
- 19) Rock outcrops

- b. A topographic map of sufficient detail to clearly show the following information:

- 1) Maximum and minimum percent slopes
- 2) Depressions on the site that may collect water
- 3) Drainageways that may attribute to rainfall run-on to or runoff from this site
- 4) Portions of the site (if any) which are located with the 100-year floodplain and how the storage facility will be protected from flooding

- c. Data and specifications for the storage facility lining material.

- d. Plan and cross-sectional views of the storage facility.

- e. Depth from the bottom of the storage facility to the seasonal high water table and separation distance to the permanent water table.

9. Land Area Requirements. Provide calculations justifying the land area requirements for land application of sewage sludge taking into consideration average soil productivity group, crop(s) to be grown and most limiting factor(s) of the sewage sludge, specifically Plant Available Nitrogen (PAN), Calcium Carbonate Equivalence (CCE), and metal loadings (CPLR sewage sludge only), where applicable. Relate PAN, CCE, and metal loadings to demonstrate the most limiting factor for land application. **See attachment**

10. Landowner Agreement Forms. Provide a properly completed **Land Application Agreement – Biosolids** Form and necessary attachments (attached at end of VPDES Sewage Sludge Permit Application Form) for each landowner if sewage sludge is to be applied onto land not owned by the applicant. **See attachment**

11. Ground Water Monitoring.

Are any ground water monitoring data available for this land application site? Yes X No

If yes, submit the ground water monitoring data with this permit application. Also submit a written description of the well locations, approximate depth to ground water, and the ground water monitoring procedures used to obtain these data.

On-Site Storage Facilities

Anaerobically digested, dewatered biosolids are conveyed to two covered concrete storage pads located on-site at the Atlantic STP. Each pad is approximately 328 feet long by 200 feet wide. Dewatered biosolids are placed in numbered bays with a front end loader and stacked an average of four feet. The following assumptions are made to determine the storage pad capacity.

Estimated plant biosolids production: 868 dry lbs/MG

Average Solids Content of biosolids: 18%

Estimated plant production: $(868 \text{ dry lbs/MG}) / 18\% = 4822 \text{ wet lbs/MG}$

Biosolids weight: 1685 lbs/yd³

Estimated biosolids volume/day at permitted design flow of 54 MGD:

$$\frac{4822 \text{ wet lbs/MG} * 54 \text{ MG}}{1685 \text{ lbs/yd}^3} = 154 \text{ yd}^3/\text{day}$$

Assuming biosolids stacked 4 feet high in a trapezoidal configuration:

$$\text{Storage Pad Volume} = \frac{\text{base area top} + \text{base area bottom}}{2} * \text{stacking height} * \text{length of pad}$$

$$\text{Storage Pad Volume} = \frac{(180 \text{ ft} + 200 \text{ ft})}{2} * 4 \text{ ft} * 328 \text{ ft} = 249,280 \text{ feet}^3$$

$$249,280 \text{ feet}^3 / 27 \text{ feet} = 9232 \text{ yd}^3$$

$$(9232 \text{ yd}^3) / 154 \text{ yd}^3/\text{day} = 60 \text{ days}$$

Total Storage Pad Capacity (2 pads) = approximately 120 days storage at design flow

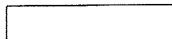
Land application spreading operations will conform to the following nutrient management criteria:

7. Biosolids Spreading Schedule.

BIOSOLIDS SPREADING SCHEDULE

CROP	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Alfalfa												
Bermuda Grass												
Corn												
Soybeans												
Hay*												
Pasture*												
Sorghum/Millet												
Small Grain												

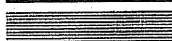
Note Late fall and winter biosolids applications may be made to a trap crop only if applications are in accordance with 4VAC5-15.
 * Cool season grasses only, Fescue and/or Orchardgrass



Spread liquid or dewatered biosolids at the rates and times specified in the nutrient management plan.



Do not spread liquid or dewatered biosolids during these shaded time periods.



Applications during these time periods shall comply with the following:

- Biosolids applications will not be made earlier than 30 days prior to planting on environmentally sensitive sites.
- On fields not listed as environmentally sensitive:
 - o Applications of dewatered anaerobically digested or dewatered lime stabilized biosolids will not occur more than 90 days prior to spring planting on fields having (i) slopes less than 7% throughout the application area or (ii) having at least 60% uniform ground cover from crop residue.
 - o Liquid biosolids applications will not occur more than 60 days prior to spring planting.



Biosolids applications should be avoided whenever possible during this period (late fall-winter). Fields must have greater than 60% uniform live cover with plant height greater than three (3) inches. Applications made to cool season grass hay and pasture, if applied after 9/1 of any year until 3/1 of the following year, shall not exceed 1/2 of the total nitrogen rate

As stipulated in 4VAC5-15, applications of sewage sludge to environmentally sensitive sites shall fully comply with these timing requirements immediately. Implementation of these timing requirements on nonenvironmentally sensitive sites shall be required for sewage sludge applications on January 1, 2009, and thereafter.

Land Area Requirements

A large inventory of land is needed to support the practice of infrequent land application (one application per three years). HRSD currently has 19,700 acres of land permitted. HRSD's land application contract requires the maintenance of a minimum of 300% over the annual usage requirement.

Additional acres are required due to increasing development of the rural community. In addition, varying crop rotations and fluctuating weather conditions affects the amount of land that is available for use. Having a large inventory of land helps perpetuate the HRSD land application program.

Based on an anticipated Soil productivity group - Class I-A, a corn or soybean crop planting, an estimated plant available nitrogen (PAN) rate of 42 lbs per acre, surface application with incorporation within 24 hours and approximately 8,000 tons production per year, an estimated 2,000 acres per year is needed to support the land application program (approximately 4 tons per acre applied).

C.10

VPDES SEWAGE SLUDGE PERMIT APPLICATION FORM SECTION C: LAND APPLICATION OF BULK BIOSOLIDS

LAND APPLICATION AGREEMENT - BIOSOLIDS

A. This land application agreement is made on 5/24/16 between Rodney Foster ^{+ Pissy} referred to here as "Landowner", and HRSD referred to here as the "Permittee". This agreement remains in effect until it is terminated in writing by either party or, with respect to those parcels that are retained by the Landowner in the event of a sale of one or more parcels, until ownership of all parcels changes. If ownership of individual parcels identified in this agreement changes, those parcels for which ownership has changed will no longer be authorized to receive biosolids or industrial residuals under this agreement.

Landowner:

The Landowner is the owner of record of the real property located in Chesapeake Virginia, which includes the agricultural, silvicultural or reclamation sites identified below in Table 1 and identified on the tax map(s) attached as Exhibit A.

Table 1.: Parcels authorized to receive biosolids

Tax Parcel ID	Tax Parcel ID	Tax Parcel ID	Tax Parcel ID
<u>110000000010</u>			
<u>1100000000210</u>			
<u>1100000000140</u>			

☐ Additional parcels containing Land Application Sites are identified on Supplement A (check if applicable)

Check one:

- ☐ The Landowner is the sole owner of the properties identified herein.
☐ The Landowner is one of multiple owners of the properties identified herein.

In the event that the Landowner sells or transfers all or part of the property to which biosolids have been applied within 36 months of the latest date of biosolids application, the Landowner shall:

1. Notify the purchaser or transferee of the applicable public access and crop management restrictions no later than the date of the property transfer; and
2. Notify the Permittee of the sale within two weeks following property transfer.

The Landowner has no other agreements for land application on the fields identified herein. The Landowner will notify the Permittee immediately if conditions change such that the fields are no longer available to the Permittee for application or any part of this agreement becomes invalid or the information herein contained becomes incorrect.

The Landowner hereby grants permission to the Permittee to land apply biosolids on the agricultural sites identified above and in Exhibit A. The Landowner also grants permission for DEQ staff to conduct inspections on the land identified above, before, during or after land application of biosolids for the purpose of determining compliance with regulatory requirements applicable to such application.

Rodney L Foster Rodney L. Foster 2108 Indian Creek Rd.
 Landowner -- Printed Name, Title Signature Mailing Address
Chesapeake VA 23322

Permittee:

HRSD the Permittee, agrees to apply biosolids on the Landowner's land in the manner authorized by the VPDES Permit Regulation and in amounts not to exceed the rates identified in the nutrient management plan prepared for each land application field by a person certified in accordance with §10.1-104.2 of the Code of Virginia.

The Permittee agrees to notify the Landowner or the Landowner's designee of the proposed schedule for land application and specifically prior to any particular application to the Landowner's land. Notice shall include the source of residuals to be applied.

☒ I reviewed the documents assigning signatory authority to the person signing for landowner above. I will make a copy of this document available to DEQ for review upon request. (Do not check this box if the landowner signs this agreement)

Rhonda L. Bowen Rhonda L. Bowen 1436 Air Rndl Ave. Va Beach, VA 23455
 Permittee -- Authorized Representative Signature Mailing Address
 Printed Name

VPDES SEWAGE SLUDGE PERMIT APPLICATION FORM
SECTION C: LAND APPLICATION OF BULK BIOSOLIDS

LAND APPLICATION AGREEMENT - BIOSOLIDS

Permittee: HRSD County or City: Chesapeake

Landowner: Rodney & Peggy Foster

Landowner Site Management Requirements:

I, the Landowner, I have received a DEQ Biosolids Fact Sheet that includes information regarding regulations governing the land application of biosolids, the components of biosolids and proper handling and land application of biosolids.

I have also been expressly advised by the Permittee that the site management requirements and site access restrictions identified below must be complied with after biosolids have been applied on my property in order to protect public health, and that I am responsible for the implementation of these practices.

I agree to implement the following site management practices at each site under my ownership following the land application of biosolids at the site:

1. Notification Signs: I will not remove any signs posted by the Permittee for the purpose of identifying my field as a biosolids land application site, unless requested by the Permittee, until at least 30 days after land application at that site is completed.
2. Public Access
 - a. Public access to land with a high potential for public exposure shall be restricted for at least one year following any application of biosolids.
 - b. Public access to land with a low potential for public exposure shall be restricted for at least 30 days following any application of biosolids. No biosolids amended soil shall be excavated or removed from the site during this same period of time unless adequate provisions are made to prevent public exposure to soil, dusts or aerosols;
 - c. Turf grown on land where biosolids are applied shall not be harvested for one year after application of biosolids when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by DEQ.
3. Crop Restrictions:
 - a. Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after the application of biosolids.
 - b. Food crops with harvested parts below the surface of the land shall not be harvested for 20 months after the application of biosolids when the biosolids remain on the land surface for a time period of four (4) or more months prior to incorporation into the soil.
 - c. Food crops with harvested parts below the surface of the land shall not be harvested for 38 months when the biosolids remain on the land surface for a time period of less than four (4) months prior to incorporation.
 - d. Other food crops and fiber crops shall not be harvested for 30 days after the application of biosolids;
 - e. Feed crops shall not be harvested for 30 days after the application of biosolids (60 days if fed to lactating dairy animals).
4. Livestock Access Restrictions:

Following biosolids application to pasture or hayland sites:

 - a. Meat producing livestock shall not be grazed for 30 days,
 - b. Lactating dairy animals shall not be grazed for a minimum of 60 days,
 - c. Other animals shall be restricted from grazing for 30 days;
5. Supplemental commercial fertilizer or manure applications will be coordinated with the biosolids and industrial residuals applications such that the total crop needs for nutrients are not exceeded as identified in the nutrient management plan developed by a person certified in accordance with §10.1-104.2 of the Code of Virginia;
6. Tobacco, because it has been shown to accumulate cadmium, should not be grown on the Landowner's land for three years following the application of biosolids or industrial residuals which bear cadmium equal to or exceeding 0.45 pounds/acre (0.5 kilograms/hectare).

Rodney L Foster
Landowner's Signature

5-24-16

Date

Page ___ of ___

12. Land Application Site Information.

(Complete Items a-d for sites receiving infrequent application - land application of sewage sludge up to the agronomic rate at a frequency of once in a 3 year period; complete Items a-h for sites receiving frequent application - land application of sewage sludge in excess of 70% the agronomic rate at a frequency greater than once in a 3 year period)

- a. Provide a general location map for each county which clearly indicates the location of all the land application sites.
- b. For each land application site provide a site plan of sufficient detail to clearly show the concerned landscape features and associated buffer zones (See instructions). Provide a legend for each landscape feature and the net acreage for each field taking into account the proposed buffer zones.
- c. In order to ensure that land application of bulk sewage sludge will not impact federally listed threatened or endangered species or federally designated critical habitat, the applicant must notify the field office of the U. S. Department of the Interior, Fish and Wildlife Service (FWS), by a letter, the proposed land application activities with the identification of the land application sites. The address and phone number of FWS are provided below.

U. S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, VA 23061
TEL: (804)693-6694

Provide a copy of the notification letter with this application form.

- d. Provide a soil survey map, preferably photographically based, with the field boundaries clearly marked. (A USDA-SCS soil survey map should be provided, if available.)
Provide a detailed legend for each soil survey map which uses accepted USDA-SCS descriptions of the typifying pedon for each soil series (soil type). Complex associations may be described as a range of characteristics. Soil descriptions shall include as a minimum the following information.
 - 1) Soil symbol
 - 2) Soil series, textural phase and slope range
 - 3) Depth to seasonal high water table
 - 4) Depth to bedrock
 - 5) Estimated soil productivity group (for the proposed crop rotation)

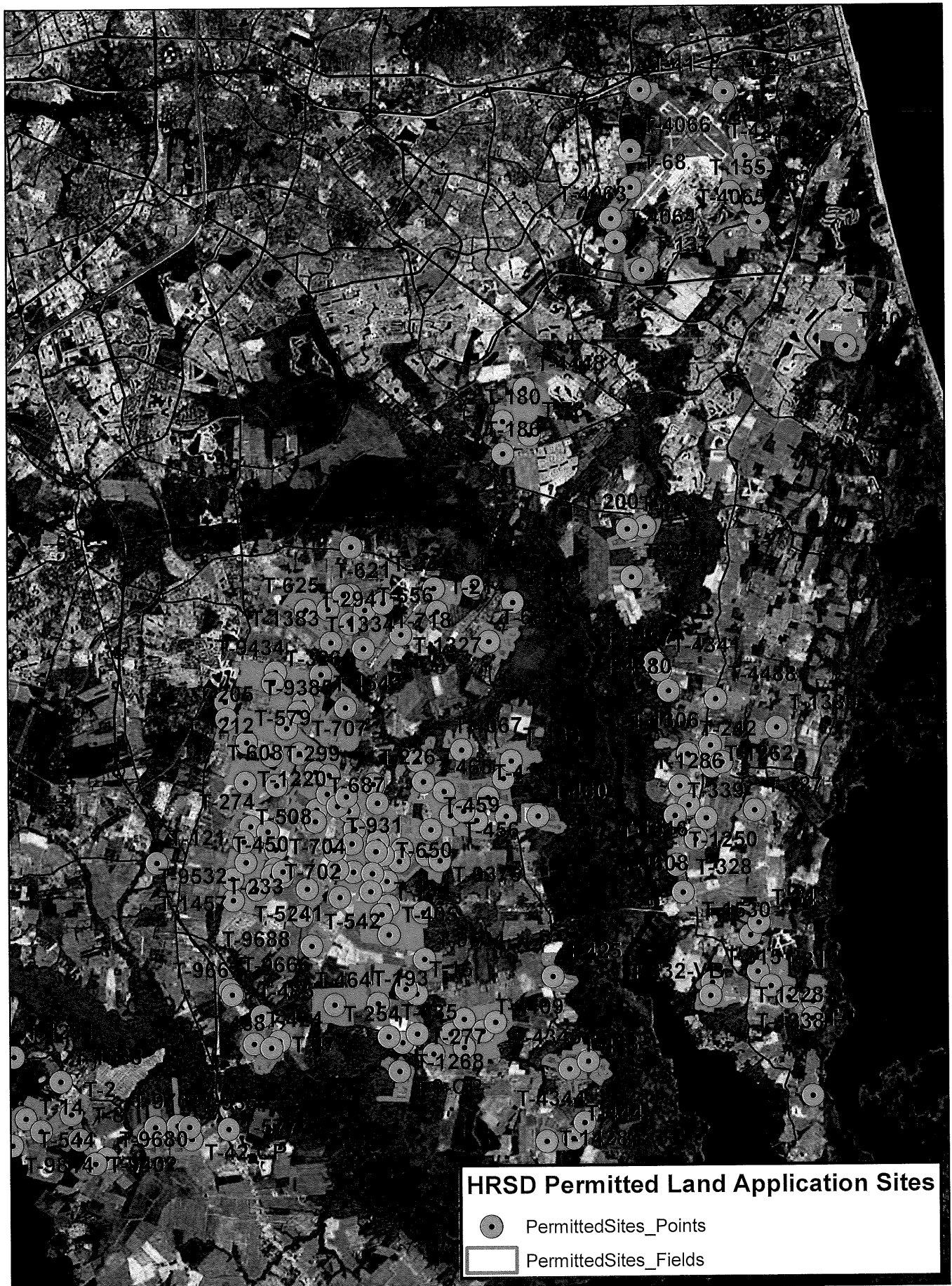
Item e - h are required for sites receiving frequent application of sewage sludge (N/A)

- e. In order to verify the information provided in item d, characterize the soil at each land application site. Representative soil borings or test pits to a depth of five feet or to bedrock if shallower, are to be coordinated for the typifying pedon of each soil series (soil type). Soil descriptions shall include as a minimum the following information:
 - 1). Soil symbol
 - 2). Soil series, textural phase and slope range
 - 3). Depth to seasonal high water table
 - 4). Depth to bedrock
 - 5). Estimated soil productivity group (for the proposed crop rotation)

Chesapeake, VA



Virginia Beach, VA





U.S. Fish & Wildlife Service
Ecological Services
P.O. Box 99
6669 Short Lane
Gloucester, VA 23061

RE: Notification of proposed sites to be land applied with biosolids

Dear Sir/Madam:

Hampton Roads Sanitation District (HRSD) has a biosolids land application program which operates under the Atlantic STP VPDES permit VA0081248 issued by the Department of Environmental Quality (DEQ). The biosolids are treated to Class B pathogen and vector attraction reduction requirements of 9VAC25-31-560. The biosolids meet the Table 3 pollutant concentration limits of 9VAC25-31-540. The biosolids are land applied to private farm sites in accordance with the management restrictions listed in 9VAC25-31-550.

HRSD periodically searches for new sites to ensure an adequate land base is maintained as previously approved sites may no longer be available due to development, change of ownership, etc. For this reason, HRSD has submitted the attached list of proposed sites to DEQ for approval in the land application program. HRSD has chosen these agricultural sites based on physical, chemical, economic, and social criteria. These are active farming sites that have already been cleared and farmed for at least five years. The land application of biosolids will provide an organic source of nutrients as an alternative to commercial fertilizer. The amount of biosolids applied to the site will not exceed the agronomic loading rate for the crop grown. A nutrient management plan is developed for each farm site receiving biosolids. The biosolids will normally be incorporated into the soil within 48 hours. However, discing is not performed on pasture and hay fields or on crop fields where the farmer has adequate crop residue and wants to maintain a no-till or minimum tillage system. The application will comply with all buffer zone requirements. HRSD does not believe that federally listed threatened or endangered species or their habitat will be impacted by land application of biosolids to these sites.

Sincerely,

James J. Pletl
Director of Water Quality

enclosure

- f. Collect and analyze soil samples from each field, weighted to best represent each of the soil borings performed for Item e. Using the table below or a separate attachment, provide at least one analysis per sample for each of the following parameters.
- Soil Organic Matter (%)
 - Soil pH (std. units)
 - Cation Exchange Capacity (meq/100g)
 - Total Nitrogen (ppm)
 - Organic Nitrogen (ppm)
 - Ammonia Nitrogen (ppm)
 - Nitrate Nitrogen (ppm)
 - Available Phosphorus (ppm)
 - Exchangeable Potassium (mg/100g)
 - Exchangeable Sodium (mg/100g)
 - Exchangeable Calcium (mg/100g)
 - Exchangeable Magnesium (mg/100g)
 - Arsenic (ppm)
 - Cadmium (ppm)
 - Copper (ppm)
 - Lead (ppm)
 - Mercury (ppm)
 - Molybdenum (ppm)
 - Nickel (ppm)
 - Selenium (ppm)
 - Zinc (ppm)
 - Manganese (ppm)
 - Particle Size Analysis or
 - USDA Textural Estimate (%)
- g. Relate the crop nutrient needs to anticipated yields, soil productivity rating and the various fertilizer or nutrient sources from sludge and chemical fertilizers. Describe any specialized agronomic management practices which may be required as a result of high soil pH. If the sludge is expected to possess an unusually high CCE or other unusual properties, provide a description of any plant tissue testing, supplemental fertilization or intensive agronomic management practices which may be necessary.
- h. Using a narrative format and referencing any related charts, describe the proposed cropping system. Show how the crop rotation and management will be coordinated with the design of the land application system. Include any supplemental fertilization program, soil testing and the coordination of tillage practices, planting and harvesting schedules and timing of land application.

FACILITY NAME: Atlantic STP

VPDES PERMIT NUMBER: VA0081248

SECTION D. SURFACE DISPOSAL Not Applicable

Complete this section only if you own or operate a surface disposal site. Provide the information for each active sewage sludge unit.

1. Information on Active Sewage Sludge Units.

- a. Unit name or number:
- b. Unit location
 - i. Street or Route#:
County:
City or Town: _____ State: _____ Zip: _____
 - ii. Latitude: _____ Longitude: _____
Method of latitude/longitude determination
_____ USGS map _____ Filed survey _____ Other _____
- c. Topographic map. Provide a topographic map (or other appropriate map if a topographic map is unavailable) that shows the site location.
- d. Total dry metric tons of sewage sludge placed on the active sewage sludge unit per 365-day period:
_____ dry metric tons.
- e. Total dry metric tons of sewage sludge placed on the active sewage sludge unit over the life of the unit:
_____ dry metric tons.
- f. Does the active sewage sludge unit have a liner with a minimum hydraulic conductivity of 1×10^{-7} cm/sec? ___Yes ___No If yes, describe the liner or attach a description.
- g. Does the active sewage sludge unit have a leachate collection system? ___Yes ___No
If yes, describe the leachate collection system or attach a description. Also, describe the method used for leachate disposal and provide the numbers of any federal, state or local permits for leachate disposal:
- h. If you answered no to either f or g, answer the following:
Is the boundary of the active sewage sludge unit less than 150 meters from the property line of the surface disposal site? ___Yes ___No If yes, provide the actual distance in meters:
- i. Remaining capacity of active sewage sludge unit, in dry metric tons: _____ dry metric tons
Anticipated closure date for active sewage sludge unit, if known: _____ (MM/DD/YYYY)
Provide with this application a copy of any closure plan developed for this active sewage sludge unit.

2. Sewage Sludge from Other Facilities.

Is sewage sludge sent to this active sewage sludge unit from any facilities other than yours? ___Yes ___No
If yes, provide the following information for each such facility, attach additional sheets as necessary.

- a. Facility name:
- b. Facility contact:
Title:
Phone: () _____
- c. Mailing address.
Street or P.O. Box:
City or Town: _____ State: _____ Zip: _____
- d. List, on this form or an attachment, the facility's VPDES permit number as well as the numbers of all other federal, state or local permits that regulate the facility's sewage sludge management practices:
Permit Number: _____ Type of Permit: _____

- e. Which class of pathogen reduction is achieved before sewage sludge leaves the other facility?
___Class A ___Class B ___Neither or unknown
- f. Describe, on this form or on another sheet of paper, any treatment processes used at the other facility to reduce pathogens in sewage sludge:

- g. Which vector attraction reduction option is achieved before sewage sludge leaves the other facility?
- ☐ Option 1 (Minimum 38 percent reduction in volatile solids)
 - ☐ Option 2 (Anaerobic process, with bench-scale demonstration)
 - ☐ Option 3 (Aerobic process, with bench-scale demonstration)
 - ☐ Option 4 (Specific oxygen uptake rate for aerobically digested sludge)
 - ☐ Option 5 (Aerobic processes plus raised temperature)
 - ☐ Option 6 (Raise pH to 12 and retain at 11.5)
 - ☐ Option 7 (75 percent solids with no unstabilized solids)
 - ☐ Option 8 (90 percent solids with unstabilized solids)
 - ☐ None or unknown
- h. Describe, on this form or another sheet of paper, any treatment processes used at the other facility to reduce vector attraction properties of sewage sludge:
- i. Describe, on this form or another sheet of paper, any other sewage sludge treatment activities performed by the other facility that are not identified in e - h above:

3. Vector Attraction Reduction.

- a. Which vector attraction reduction option, if any, is met when sewage sludge is placed on this active sewage sludge unit?
- ☐ Option 9 (Injection below land surface)
 - ☐ Option 10 (Incorporation into soil within 6 hours)
 - ☐ Option 11 (Covering active sewage sludge unit daily)
- b. Describe, on this form or another sheet of paper, any treatment processes used at the active sewage sludge unit to reduce vector attraction properties of sewage sludge:

4. Ground Water Monitoring.

- a. Is ground water monitoring currently conducted at this active sewage sludge unit or are ground water monitoring data otherwise available for this active sewage sludge unit? ☐ Yes ☐ No
If yes, provide a copy of available ground water monitoring data. Also provide a written description of the well locations, the approximate depth to ground water, and the ground water monitoring procedures used to obtain these data.
- b. Has a ground water monitoring program been prepared for this active sewage sludge unit?
☐ Yes ☐ No If yes, submit a copy of the ground water monitoring program with this application.
- c. Have you obtained a certification from a qualified ground water scientist that the aquifer below the active sewage sludge unit has not been contaminated? ☐ Yes ☐ No
If yes, submit a copy of the certification with this application.

5. Site-Specific Limits.

- Are you seeking site-specific pollutant limits for the sewage sludge placed on the active sewage sludge unit?
☐ Yes ☐ No If yes, submit information to support the request for site-specific pollutant limits with this application.

VPDES PERMIT NUMBER: VA0081248

Complete this section for sewage sludge that is land applied unless any of the following conditions apply:

The sewage sludge is sold or given away in a bag or other container for application to the land (fill out B.5 instead); or

You provide the sewage sludge to another facility for treatment or blending (fill out B.6 instead).

Complete Section C for every site on which the sewage sludge that you reported in B.7 is land applied.

- VPDES Sewage Sludge Permit Application Form (Rev 9/14/2012)

Groundwater sites



Notes:

Each site consists of a deep (~50') and shallow (~35') monitoring well pair.

MW-5 has only one deep monitoring well.

MW-1 was discontinued in 2014.

VPDES PERMIT NUMBER: VA0081248

- Complete Questions 7-12 below only if you apply sewage sludge, or you are responsible for land application of sewage sludge. Information required by these questions may be prepared as attachments to this form. Skip the following questions if you contract land application to someone else (as indicated under Section A.7) who is responsible for the operation.

- PCBs (mg/kg)
pH (S. U.)
Percent Solids (%)
Ammonium Nitrogen (mg/kg)
Nitrate Nitrogen (mg/kg)
Total Kjeldahl Nitrogen (mg/kg)
Total Phosphorus (mg/kg)
Total Potassium (mg/kg)
Alkalinity as CaCO_3^* (mg/kg)

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8. Storage Requirements.

Existing and proposed sludge storage facilities must provide an estimated annual sludge balance on a monthly basis incorporating such factors as storage capacity, sludge production and land application schedule. Include pertinent calculations justifying storage requirements.

Proposed sludge storage facilities must also provide the following information:

- a. A sludge storage site layout on a 7.5 minute topographic quadrangle or other appropriate scaled map to show the following topographic features of the surrounding landscape to a distance of 0.25 mile. Clearly mark the property line.

- 1) Water wells, abandoned or operating
- 2) Surface waters
- 3) Springs
- 4) Public water supply(s)
- 5) Sinkholes
- 6) Underground and/or surface mines
- 7) Mine pool (or other) surface water discharge points
- 8) Mining spoil piles and mine dumps
- 9) Quarry(s)
- 10) Sand and gravel pits
- 11) Gas and oil wells
- 12) Diversion ditch(s)
- 13) Agricultural drainage ditch(s)
- 14) Occupied dwellings, including industrial and commercial establishments
- 15) Landfills or dumps
- 16) Other unlined impoundments
- 17) Septic tanks and drainfields
- 18) Injection wells
- 19) Rock outcrops

- b. A topographic map of sufficient detail to clearly show the following information:

- 1) Maximum and minimum percent slopes
- 2) Depressions on the site that may collect water
- 3) Drainageways that may attribute to rainfall run-on to or runoff from this site
- 4) Portions of the site (if any) which are located with the 100-year floodplain and how the storage facility will be protected from flooding

- c. Data and specifications for the storage facility lining material.

- d. Plan and cross-sectional views of the storage facility.

- e. Depth from the bottom of the storage facility to the seasonal high water table and separation distance to the permanent water table.

9. Land Area Requirements. Provide calculations justifying the land area requirements for land application of sewage sludge taking into consideration average soil productivity group, crop(s) to be grown and most limiting factor(s) of the sewage sludge, specifically Plant Available Nitrogen (PAN), Calcium Carbonate Equivalence (CCE), and metal loadings (CPLR sewage sludge only), where applicable. Relate PAN, CCE, and metal loadings to demonstrate the most limiting factor for land application.

10. Landowner Agreement Forms. Provide a properly completed Sewage Sludge Application Agreement Form (attached) for each landowner if sewage sludge is to be applied onto land not owned by the applicant.

11. Ground Water Monitoring.

Are any ground water monitoring data available for this land application site? X Yes No

If yes, submit the ground water monitoring data with this permit application. Also submit a written description of the well locations, approximate depth to ground water, and the ground water monitoring procedures used to obtain these data. See attachment.

PROGRESS FARM GROUNDWATER SAMPLING PLAN

Each well site consists of a pair of monitoring wells, one installed at a depth of 35 feet and another installed to a depth of 50 feet (approximate depths). One site (5A) has only a 50 foot well due to a single continuous water bearing strata between 35 and 50 feet. There are a total of six well sites and they are located around the perimeter of the Progress Farm.

The generalized groundwater monitoring protocol is as follows:

- Groundwater depth is measured and recorded.
- Groundwater is purged until water quality is stabilized.
- Samples are collected with dedicated submersible pumps.
- Samples are preserved and placed on ice for transport to HRSD's Central Environmental Laboratory.

DATE	WELL	REP	WATER LEVEL m relative to MSL	ORGN mg/l	ORGANIC NITROGEN	NOX mg/l	TP mg/l	PH	ALK mg/l	CL mg/l	CHLORIDES	TC #/100 ml	TOTAL COLIFORM	COND umhos/cm	TSS mg/l	HARD	HARDNESS	AG ug/l	AS ug/l	BA ug/l	CD ug/l	CA mg/l	CR ug/l	CU ug/l	HG ug/l	MG mg/l	MO ug/l	PB ug/l	SE ug/l	ZN ug/l	
3/12/2014	2A	1	0.85	-0.5	0.34	-0.2	0.28	7.44	97	19				298	-1	119		0.3	0.15	5.39	-0.05	38.2	0.57	0.57	-0.5	-0.1	5.64		-0.1	-0.5	-2
3/12/2014	2B	1	0.9	-0.5	-0.2	-0.2	0.2	6.2	30	29				308	9	111		0.16	0.38	12.7	0.05	22.1	1.98	18.3	-0.1	13.5		0.3	-0.5	2.37	
3/12/2014	3A	1	0.81	-0.5	1.28	-0.2	0.73	7.27	229	79				656	-1	173		0.4	-0.1	9.97	-0.05	49.3	0.71	-0.5	-0.1	12.2		-0.1	-0.5	4.65	
3/12/2014	3B	2	0.52	-0.5	1.06	-0.2	0.64	7.37	202	54				593	22	167		0.36	0.11	7.54	-0.05	51.8	1.6	-0.5	-0.1	9.09		0.11	-0.5	4.97	
3/12/2014	3B	1	0.52	-0.5	1.07	-0.2	0.67	7.16	206	52				1981	2.6	165		0.44	0.11	7.71	-0.05	50.9	1.68	-0.5	-0.1	9.12		-0.1	-0.5	3.79	
3/12/2014	4A	1	0.76	-0.5	1.51	-0.2	0.67	7.33	323	485				741	9.7	238		0.48	0.13	52.8	0.1	57	2.59	-0.5	-0.1	23.2		0.43	-0.5	2.53	
3/12/2014	4B	1	0.5	-0.5	1.05	-0.2	0.63	7.24	224	107				732	19.2	227		0.54	0.12	16.6	-0.05	64.1	1.43	-0.5	-0.1	16.3		0.3	-0.5	2.88	
3/12/2014	5A	1	0.59	-0.5	1.28	-0.2	0.41	6.89	210	114				650	-1	289		0.18	-0.1	8.42	-0.05	80.2	1.88	-0.5	-0.1	16.8		0.18	-0.5	3.62	
3/12/2014	6A	1	0.89	-0.5	1.96	-0.2	0.48	7.16	291	29				638	12.3	259		0.29	0.16	4.46	0.06	78.8	3.45	5.53	-0.1	15.3		2.88	-0.5	4.51	
3/12/2014	6C	1	0.86	-0.5	1.27	-0.2	0.59	7.09	259	21				630	5.4	228		0.29	1.13	10.8	-0.05	54.4	2.87	-0.5	-0.1	22.3		0.13	-0.5	-2	
3/12/2014	7A	1	0.84	-0.5	2.53	-0.2	0.52	7.28	289	38				990	4.4	220		0.13	0.21	2.33	-0.05	65.5	1.91	-0.5	-0.1	13.7		-0.1	-0.5	2.28	
3/12/2014	7B	1	0.92	-0.5	1.79	-0.2	0.43	7.17	255	31								-0.1	-0.1	-0.1	-0.05	-0.3	-0.5	-0.5	-0.1	-0.1		-0.1	-0.5	2.08	
3/12/2014	FB 1	1		-0.5	-0.2	-0.2	-0.2									-1.16		-0.1	-0.1	-0.1	-0.05	-0.3	-0.5	-0.5	-0.5	-0.1	-0.1	-0.1	-0.5	2.84	
3/12/2014	FB 2	1		-0.5	-0.2	-0.2	-0.2									-1.16		-0.1	-0.1	-0.1	-0.05	-0.3	-0.5	-0.5	-0.5	-0.1	-0.1	-0.1	-0.5		
3/12/2014	100B	1	0.9																												
3/12/2014	100C	1	0.99																												
3/12/2014	2A	1	0.98	-0.5	0.26	-0.2	0.26	7.62	98	19.9				316	-1	124		-0.1	0.18	5.07	-0.05	39.8	0.56	-0.5	-0.5	-0.1	5.88		-0.1	-0.5	-2
5/1/2014	2A	1	1	-0.5	-0.2	-0.2	-0.2	6.3	30	26				334	3.3	111		-0.1	0.3	12.2	-0.05	22.4	0.79	8.63	-0.5	-0.1	13.4		0.32	-0.5	-2
5/1/2014	3A	1	1.34	-0.2	0.74	-0.2	0.74	7.33	230	80.8				508	-1	170		-0.1	-0.1	10.1	-0.05	48	0.67	-0.5	-0.1	12.2		-0.1	-0.5	-2	
5/1/2014	3B	2	0.92	-0.5	1.15	-0.2	0.69	7.54	206	54.8				588	-1	171		-0.1	-0.1	6.91	-0.05	52.9	1.49	-0.5	-0.1	9.51		-0.1	-0.5	-2	
5/1/2014	3B	1	0.92	-0.5	1.12	-0.2	0.67	7.54	209	54.4				588	-1	166		-0.1	-0.1	7.26	-0.05	51.2	1.51	-0.5	-0.1	9.33		-0.1	-0.5	-2	
5/1/2014	4A	1	0.88	-0.5	1.69	-0.2	0.61	7.28	330	561				427	1	252		-0.1	0.15	6.2	-0.05	58.6	1.4	-0.5	-0.1	25.7		-0.1	-0.5	-2	
5/1/2014	4B	1	1.13	-0.5	1.13	-0.2	0.57	7.34	242	121				866	2.8	161		-0.1	0.41	11.3	-0.05	47.3	0.99	-0.5	-0.1	10.4		0.16	-0.5	-2	
5/1/2014	5A	1	0.74	-0.5	1.34	-0.2	0.43	6.92	206	107				799	19	227		-0.1	0.1	16.8	-0.05	63.5	1.49	-0.5	-0.1	16.5		-0.1	-0.5	-2	
5/1/2014	6A	1	0.95	-0.5	2.01	-0.2	0.49	7.15	289	38.1				711	11.3	251		-0.1	0.1	8.74	-0.05	78.9	3.33	-0.5	-0.1	16.8		-0.1	-0.5	-2	
5/1/2014	6C	1	0.95	-0.5	1.59	-0.2	0.72	7.02	256	54.8				716	8	239		-0.1	0.76	10.2	-0.05	54.3	0.65	-0.5	-0.1	14.9		1.39	-0.5	-2	
5/1/2014	7A	1	0.9	-0.5	2.78	-0.2	0.5	7.25	291	38.9				614	1.1	218		-0.1	-0.1	2.39	-0.05	64.5	1.32	-0.5	-0.1	13.9		-0.1	-0.5	-2	
5/1/2014	7B	1	0.95	-0.5	1.97	-0.2	0.52	7.1	255	31.5								-0.1	-0.1	-0.1	-0.05	-0.5	-0.5	-0.5	-0.1	-0.1		-0.1	-0.5	-2	
5/1/2014	FB 1	1		-0.5	-0.2	-0.2	-0.2											-0.1	-0.1	-0.1	-0.05	-0.5	-0.5	-0.5	-0.5	-0.1	-0.1	-0.1	-0.5	-2	
5/1/2014	FB 2	1		-0.5	-0.2	-0.2	-0.2											-0.1	-0.1	-0.1	-0.05	-0.5	-0.5	-0.5	-0.5	-0.1	-0.1	-0.1	-0.5	-2	
5/1/2014	100B	1	0.95																												
5/1/2014	100C	1	1.06																												
8/14/2014	2A	1	0.58	-0.5	0.41	-0.2	0.29	7.6	89	21.4				326	-1	123		-0.1	-0.1	6.31	-0.05	39.1	1.07	-0.5	-0.5	-0.1	6.09	-0.2	-0.1	-0.5	-2
8/14/2014	2B	1	0.57	-0.5	-0.2	-0.2	-0.2	6.36	-30	26.9				344	1.7	115		-0.1	0.41	12.4	-0.05	23.1	0.87	4.41	-0.1	14		-0.2	0.11	-0.5	-2
8/14/2014	3A	1	0.52	-0.5	1.1	-0.2	0.75	7.39	214	65.9				621	-1	149		-0.1	-0.1	9.16	-0.05	42.3	0.69	-0.5	-0.1	10.6		-0.2	-0.1	-0.5	-2
8/14/2014	3B	2	0.49	-0.5	0.98	-0.2	0.63	7.41	167	36				488	-1	166		-0.1	-0.1	6.68	-0.05	52	0.79	-0.5	-0.1	8.89	-0.2	-0.1	-0.5	-2	
8/14/2014	3B	1	0.49	-0.5	0.98	-0.2	0.63	7.4	168	36.2				1676	2.6	190		-0.1	-0.1	39.8	-0.05	46.3	0.81	-0.5	-0.1	8.88	-0.2	-0.1	-0.5	-2	
8/14/2014	3B	1	0.38	-0.5	1.39	-0.2	0.66	7.24	313	368				754	2.8	160		-0.1	0.44	11.6	-0.05	47	1.76	-0.5	-0.1	18.1	-0.2	-0.1	-0.5	-2	
8/14/2014	4A	1	0.35	-0.5	1.06	-0.2	0.65	7.27	222	105				764	5.9	226		-0.1	-0.1	16.2	-0.05	63.4	1.11	-0.5	-0.1	16.3	-0.2	-0.1	-0.5	-2	
8/14/2014	5A	1	0.35	-0.5	1.22	-0.2	0.4	7.01	208	107				670	0	261		-0.1	-0.1	8.75	-0.05	77.8	1.84	-0.5	-0.1	16.2	-0.2	-0.1	-0.5	2.93	
8/14/2014	6A	1	0.55	-0.5	2.09	-0.2	0.53	7.19	289	39.8				659	4.9	245		-0.1	-0.1	4.26	-0.05	74.1	2.71	1.12	-0.1	14.5	-0.2	0.94	-0.5	-2	
8/14/2014	6C	1	0.62	-0.5	1.52	-0.2	0.74	7.09	253	53				644	1.8	219		-0.1	0.93	9.46	-0.05	55.1	0.55	-0.5	-0.1	19.7	0.59	0	-0.5	-2	
8/14/2014	7A	1	0.54	-0.5	2.5	-0.2	0.6	7.33	278	34.1				588	1.1	219		-0.1	-0.1	2.48	-0.05	65	1.76	-0.5	-0.1	13.8	-0.2	-0.1	-0.5	-2	
8/14/2014	7B	1	0.7	-0.5	2.03	-0.2	0.59	7.55	256	31.7								-0.1	-0.1	0	-0.05	-0.5	-0.5	-0.5	-0.5	-0.1	-0.2	-0.1	-0.5	-2	
8/14/2014	FB 1	1		-0.5	-0.2	-0.2	-0.2											-0.1	-0.1	-0.1	-0.05	-0.5	-0.5	-0.5	-0.5	-0.1	-0.2	-0.1	-0.5	-2	
8/14/2014	FB 2	1		-0.5	-0.2	-0.2	-0.2											-0.1	-0.1	-0.1	-0.05	-0.5	-0.5	-0.5	-0.5	-0.1	-0.2	-0.1	-0.5	-2	
8/14/2014	100B	1	0.28																												
8/14/2014	100C	1	0.37																												
10/23/2014	2A	1	0.58	-0.5	0.42	-0.2	0.34	7.48	89	21.3				331	1.2	128		0.62	-0.1	6.55	-0.05	40.6	0.82	-0.5	-0.5	-0.1	6.53	-0.2	-0.1	-0.5	-2
10/23/2014	2B	1	0.54	-0.5	-0.2	-0.2	-0.2	6.26	-30	26.7				349	2.1	116		2.01	0.42	13	-0.05	22.5	0.92	3.82	-0.1	14.6	-0.2	0.14	-0.5	-2	
10/23/2014	3A	1	0.52	-0.5	1.19	-0.2	0.77	7.3	216	66.5				634	-1	160		1.35	-0.1	9.22	-0.05	45.1	1.02	-0.5	-0.1	11.5	-0.2	-0.1	-0.5	-2	
10/23/2014	3B	2	1.05	-0.5	1.05	-0.2	0.69	7.47	197	46.3				535	-1	163		1.26	-0.1	6.6	-0.05	50.4	1.39	-0.5	-0.1	9.04	-0.2	-0.1	-0.5	-2	
10/23/2014	3B	1																													

[illegible]

12. Land Application Site Information.

(Complete Items a-d for sites receiving infrequent application - land application of sewage sludge up to the agronomic rate at a frequency of once in a 3 year period; complete Items a-h for sites receiving frequent application - land application of sewage sludge in excess of 70% the agronomic rate at a frequency greater than once in a 3 year period)

- a. Provide a general location map for each county which clearly indicates the location of all the land application sites.
- b. For each land application site provide a site plan of sufficient detail to clearly show the concerned landscape features and associated buffer zones (See instructions). Provide a legend for each landscape feature and the net acreage for each field taking into account the proposed buffer zones.
- c. In order to ensure that land application of bulk sewage sludge will not impact federally listed threatened or endangered species or federally designated critical habitat, the applicant must notify the field office of the U. S. Department of the Interior, Fish and Wildlife Service (FWS), by a letter, the proposed land application activities with the identification of the land application sites. The address and phone number of FWS are provided below.

U. S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, VA 23061
TEL: (804)693-6694

Provide a copy of the notification letter with this application form.

- d. Provide a soil survey map, preferably photographically based, with the field boundaries clearly marked. (A USDA-SCS soil survey map should be provided, if available.)
Provide a detailed legend for each soil survey map which uses accepted USDA-SCS descriptions of the typifying pedon for each soil series (soil type). Complex associations may be described as a range of characteristics. Soil descriptions shall include as a minimum the following information.
 - 1) Soil symbol
 - 2) Soil series, textural phase and slope range
 - 3) Depth to seasonal high water table
 - 4) Depth to bedrock
 - 5) Estimated soil productivity group (for the proposed crop rotation)

Item e - h are required for sites receiving frequent application of sewage sludge

- e. In order to verify the information provided in item d, characterize the soil at each land application site. Representative soil borings or test pits to a depth of five feet or to bedrock if shallower, are to be coordinated for the typifying pedon of each soil series (soil type). Soil descriptions shall include as a minimum the following information:
 - 1). Soil symbol
 - 2). Soil series, textural phase and slope range
 - 3). Depth to seasonal high water table
 - 4). Depth to bedrock
 - 5). Estimated soil productivity group (for the proposed crop rotation)

- f. Collect and analyze soil samples from each field, weighted to best represent each of the soil borings performed for Item e. Using the table below or a separate attachment, provide at least one analysis per sample for each of the following parameters.
- Soil Organic Matter (%)
 - Soil pH (std. units)
 - Cation Exchange Capacity (meq/100g)
 - Total Nitrogen (ppm)
 - Organic Nitrogen (ppm)
 - Ammonia Nitrogen (ppm)
 - Nitrate Nitrogen (ppm)
 - Available Phosphorus (ppm)
 - Exchangeable Potassium (mg/100g)
 - Exchangeable Sodium (mg/100g)
 - Exchangeable Calcium (mg/100g)
 - Exchangeable Magnesium (mg/100g)
 - Arsenic (ppm)
 - Cadmium (ppm)
 - Copper (ppm)
 - Lead (ppm)
 - Mercury (ppm)
 - Molybdenum (ppm)
 - Nickel (ppm)
 - Selenium (ppm)
 - Zinc (ppm)
 - Manganese (ppm)
 - Particle Size Analysis or
 - USDA Textural Estimate (%)
- g. Relate the crop nutrient needs to anticipated yields, soil productivity rating and the various fertilizer or nutrient sources from sludge and chemical fertilizers. Describe any specialized agronomic management practices which may be required as a result of high soil pH. If the sludge is expected to possess an unusually high CCE or other unusual properties, provide a description of any plant tissue testing, supplemental fertilization or intensive agronomic management practices which may be necessary.
- h. Using a narrative format and referencing any related charts, describe the proposed cropping system. Show how the crop rotation and management will be coordinated with the design of the land application system. Include any supplemental fertilization program, soil testing and the coordination of tillage practices, planting and harvesting schedules and timing of land application.